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Micro-Foundation of the Resource-Based View:

An Empirical Investigation of the Process of Individual Level Resource Development through Management Training and Education in Healthcare

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Abstract

A fundamental assertion of the resource-based view (RBV) is that a firm gains competitive advantage through the exploitation of developed or acquired resources that are valuable, rare, in-imitable, and non-substitutable (VRIN). The purpose of this study is to examine the micro-foundations of the individual level precursor process in resource development prior to gaining competitive advantage. The study does not claim to explain a causal link between resource and competitive advantage. The study explores the process of embedding individual level managerial attributes or capabilities of competency and confidence in human capital resource in the knowledge intensive Canadian medical healthcare sector. The medical healthcare setting provided a unique and important setting to investigate and empirically test the micro-foundations of RBV. The study investigated the impact of management training and education of Canadian medical professionals' self-reported confidence and competency on various clinical and management tasks.

The results of the study indicated that, first, for a number of management tasks; there is a statistically significant increase in self-reported competency if the medical professionals had some form of formal management education and/or training. Second, a high degree of competency and confidence in clinical tasks was observed and was not affected by management education. Third, different types of management training can produce small but statistically significant differences in the level of self-rated competency in management tasks. The primary conclusion of the study was first, in the micro-foundation investigation, that individual level attributes or managerial capabilities of confidence and competency can be embedded in the development of the human capital resource through management training and education. Second, the individual level attributes or managerial capabilities of medical professionals, once embedded through management training in the medical healthcare setting, fulfill the VRIN criteria as set by the RBV for a firm to gain competitive advantage. The study further offers a mixed methods approach template to study the micro-foundation of the RBV. Finally, the study, through empirical findings, makes a mid-level theoretical contribution supporting

the underpinnings of the resource-based view concepts related to human capital resource development.

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Author's Declaration

I declare that, except where explicit reference is made to the contribution of others, this thesis is my own original work and has not been submitted for any other degree at the University of Glasgow or any other institution.

Signed: Asif R Khan

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Chapter 1

1 Introduction

The purpose of this chapter is to introduce the study and the motivation for the research, outlining the overall summary of objectives and framework of the study. The chapter guides the reader through the structure of the work, beginning with a brief explanation of the aim and focus of the research and its central questions. The development of human capital considerations in the RBV literature is outlined prior to setting out the nature of the debate on firm performance and the attainment of competitive advantage. Finally, the chapter sets out the efficiency-based explanation of performance differences in the creation of economic value, or net benefit, seeking correlations between human capital resource and competitive advantage before describing the research approach taken for the study.

1.1 Resource-Based View in Strategic Management

The field of strategic management is a relatively new social science field that has gained increasing recognition and popularity in the last 30 years among scholars and practitioners. The field has been evolving in its focus on the success and failure of firms, which is a primary concern of senior management (Rumelt et al., 1991). The key development and concepts for this field investigate how firms gain competitive advantage and outperform rivals in the same industry (Barney and Clarke, 2007). Prior to the 1980s, the field was characterized by scholars generally giving equal attention to both the strengths and weaknesses of a firm and the opportunities and threats for a firm within a competitive environment (Priem and Butler, 2001a). This balanced focus was reflected in the early significant contributions of scholars such as Andrews (1971), Ansoff (1965), and Learned et al., (1965).

The 1980s heralded a conceptual shift, moving towards a dominant focus on an external industry perspective, set in an economic framework. The shift was led by the influential publication *Competitive Strategy* (1980) by Michael Porter. This was singularly the dominant scholarly focus for about a decade until the popularization

of the Resource-Based View in the 1990s (Barney, 1991). Initially, Wernerfelt's publication in 1984, '*Resource-based View of the Firm'* did not receive much attention and by the author's own admission, was not initially cited frequently (Wernerfelt, 1995). Interestingly, this mirrored the pattern of Penrose's work (1959) also being largely overlooked for a significant period before becoming perceived as a seminal piece in the RBV literature. However, a subtle shift occurred in the literature with increasing attention paid to internal-firm perspectives. The conceptual shift heightened as scholars (e.g., Barney, 1986, 1991; Dierickx and Cool, 1989; Prahalad and Hamel, 1990; Rumelt, 1984), began to focus on internal organizational frameworks, suggesting that resource bundles might be the source of competitive advantage. In the field of strategic management, the RBV of the firm advocates that a firm achieves a competitive advantage through the application of the bundle of productive resources it possesses (Barney, 1991; Barney and Clarke, 2007; Peteraf, 1993; Rumelt, 1984; Wernerfelt, 1984).

The potential source of competitive advantage arising from the resource bundles is based on the resource heterogeneity and resource immobility assumptions; that different firms possess different bundles of productive resources (Barney, 1991). The *resource immobility assumption* is based on the '(1) the resources that a firm possesses enable the firm to exploit opportunities or neutralize threats, (2) these resources are possessed by a small number of competing firms, and (3) they are costly to copy or inelastic in supply' (Barney, 1997: 142).

1.2 Resource-Based View and Human Capital

In the internal-firm perspective, scholars have struggled to achieve consensus or any compelling empirical / theoretical explanation of the concepts of competitiveness. One explanation of these difficulties is the challenge of dealing with complex attributes comprising human capital. Human capital, a category of resource, comprises attributes of single individuals (Barney, 1997). These attributes are part of a less tangible resource of a firm and include training, education, skills, insights, abilities, relationships, and intelligence of individual managers and workers (Becker, 1964). Some scholars (e.g., Black and Boal, 1994; Itami, 1987)

have described the human capital as intangible and socially complex. The measurement techniques used to overcome the challenges of less tangible human attributes are discussed in the methodology chapter 6.

The impact of human capital resource on value creation has been a frequent topic of debate in the literature (e.g., Amihud and Lev, 1981; Barney, 1997; Becker, 1964; Lang, 1994; Rigdon 1993; Weiss, 1983). Aspects of the human capital resource, such as management skills and individual ability, constitute parts of the invisible assets perceived as necessary for competitive success (Itami, 1987). The invisible or intangible asset either advantageously or disadvantageously positions a firm to exploit new opportunities (Jacobson, 1990). Commonly cited examples of intangible human capital resources that a firm draws from to gain competitive advantage are the firm's valuable knowledge and skills of management and workers (Hitt and Ireland, 2002). While management know-how appears intuitively important, it is nevertheless an invisible asset when compared to the visible (physical) assets required for business operations (Itami, 1987). Yet, maintaining existing intangible assets and developing new capabilities, competencies and skills that enhance the resource base of the firm are likely to be imperative to competing successfully in increasingly knowledge-intensive contexts.

Hence, scholars face a significant challenge in developing a persuasive explanation of the ways in which intangible assets develop competitiveness. However, a precursor to such an explanation would be to establish some clarity on the ways resource bundles are developed within the firm, a point that is the specific focus of the study. Several scholars have focused on the skills, resources and capabilities that reside within the firm as a promising area of exploration (Barney, 1991; Dierickx and Cool, 1989; Penrose, 1959; Rumelt, 1984; Teece, 1998; Wernerfelt, 1984). This shift in focus is not without criticism (e.g., Ghemawat, 1991; Porter, 1991; Priem and Butler, 2001), and scholars often point to the neglect or diminished relevance of the market environment when considering competitive advantage from an RBV perspective (Ghemawat, 1991). Other scholars have pointed to the disconnected concepts and questionable structural foundation that the RBV framework embodies (Priem and Butler, 2001). Against the backdrop of such

criticisms, there are gaps in the literature and opportunities for further research to address the links and deficiencies in our understanding of competitive advantage.

Perhaps the most important gap relates to the theoretical status of the RBV because it has proven difficult to test empirically (Hitt et al., 1998). These challenges are made more difficult by the vague definitions and fixed approach evident in the development of the RBV (Priem and Butler, 2001). Godfrey and Hill (1995) suggest that this is a particular problem in relation to intangible and unobservable resources. Since the early contributions (e.g., Barney, 1986; Conners, 1991; Penrose, 1954; Wernerfelt, 1984) in the RBV, there is has been considerable literature on acquisition, diversification and organisation of resources (e.g., Maritan and Peteraf, 2011; Sirmon et al., 2011; Wernerfelt, 2011). In the same period, there has been little in the RBV literature regarding the process of resource development, the micro-foundations of the perspective, links to sustainability and competitive advantage, and links to other perspectives in strategic management (Barney et al., 2011).

1.3 Research Aims

The broad research aim is to contribute towards the apprehension and interrogation of the micro-foundations and processes of human capital development at an individual level focus, within the RBV. Specifically, the work is situated in the knowledge-intensive Canadian health care sector, and centres on the self-reported competences and capabilities of highly-trained medical professionals. The study aims to contribute to the literature regarding the process of human capital resource development in the Canadian health care sector. As noted, empirical research in the RBV of organizations is relatively sparse (Michalisin et al., 2004; Miller and Shamsie, 1996). Since the inception and popularization of the RBV over the past three decades, scholars have written numerous conceptual and review articles (e.g., Barney, 1991; Foss, 1997; Peteraf, 1993; Wang and Ahmed, 2007). Nonetheless, Miller and Shamsie (1996), for example, have pointed to a greater need for more systematic empirical research to examine the RBV's conceptual basis and its knowledge claims. The slow breakout from this early stage of empirical

contributions is perhaps one symptom stemming from the lack of consensus on definitions, vagueness of the concepts and difficulties in categorising and measuring properties of resources (Foss, 1997; Thomas and Pollock, 1999).

Prominent critics of the RBV (e.g., Foss et al., 2008; Foss and Knudsen, 2003; Makadok, 2001b; Priem and Butler, 2001; Spender, 2006) have identified challenges related to generalizability, lack of applicability, and poor terminology and definitions. In recent debates about RBV, RBV scholars (e.g., Kraaijenbrink et al., 2010) have identified challenges and opportunities to strengthen its conceptual underpinnings. Some of the areas identified to strengthen the RBV are the micro-foundation, the process of resource acquisition and development, interlinks to other perspectives, sustainability and finally methods and measurements (Barney et al., 2011).

The central critique is that the RBV represents a tautology, 'a statement of relationship that is true by logic', and that it therefore cannot be generalized to be a theory (Priem and Butler, 2001b: 58). This appraisal has been the central obstacle to the RBV achieving acceptance at a theoretical status by some of its staunchest critics (e.g., Collis, 1994; Priem and Butler, 2001b). The argument against this assertion by RBV proponents is that at a definitional level, all strategic management theories could be considered or reduced to tautological reasoning (Barney, 2001). Hence for Barney (2001), this is an example of Coasian Tautology, in which a theory may be restated in ways that make it tautological, providing no insights about empirical testability of the theory. However, in the ten years after Barney first refuted Priem and Butler's assertion that RBV still lacked progress towards theoretical status, there has been limited progress in challenging this assertion further, a point that Barney himself acknowledges (2011).

The empirical research of the resource-based view (RBV) is still in an emergent stage of development (Michalisin et al., 2004). This study primarily makes an empirical contribution to the examination of the micro-foundations of the RBV. It investigates the extent to which competiveness may be caused and associated with resources bundles acquired or developed by the organization. It does so from an

individualistic perspective through the lens of a human capital approach. The work therefore contributes to the analysis of the development of individual level attributes or managerial capabilities embedded in the resource bundles within an organization.

There has been an effort to establish a micro-foundation for the RBV and strategic management in the last ten years (Kraaijenbrink et al., 2010; Barney et al., 2011). A promising focus of micro-foundation research on the development of human capital has formed both at the organizational level (e.g., Prahalad and Hamel, 1990) and at the individual level (Garbuio et al., 2011). The study focuses on several of the key areas identified in the recent debates: the micro-foundation, resource development, issues regarding methods of measurement and further empirical research for strengthening the RBV. Although the study takes an aggregated approach within this focus, it is also important to acknowledge the managerial capabilities in the dynamic capabilities stream.

1.3.1. Micro-foundation examination of Managerial Capabilities in the Dynamic Capability Stream

Earlier scholarly literature in dynamic capabilities examined the broader issues of differentiating dynamic capabilities from the RBV (e.g., Winter, 2003; Helafat, et al, 2007; Teece, 2009) as well as the development of capabilities (e.g. Ethiraj, Kale, Krishnan, and Singh, 2005). As the stream developed alongside the broader RBV, some scholars called for the micro-foundational inquiry and proposed models to study the dynamic capabilities concepts, definitions, differing capabilities and focus on the managerial operational capabilities (e.g., Pavlou and El Sawy, 2011). This was proposed in the hopes of making the terminology clearer and enhances the vague concepts in dynamic capability stream.

Much like the broader RBV, dynamic capability, a stream of the RBV, has struggled with micro-foundational issues. The concepts of organizational level capabilities have been examined by scholars (e.g., Helfat and Peteraf, 2003) along with the research approach in methodology and measurement (e.g., Dutta et al, 2004).

There has also been a drive to study the concepts of individual managerial level capabilities as well (e.g., Adner and Helfat, 2003).

In the last decade there has been a concerted effort for important micro-foundational understanding in the dynamic capabilities stream focusing on the individual attributes of the mangers on the development of capabilities. The micro-foundational focus on managerial capabilities in the dynamic capability and specifically dynamic managerial capability streams has extended to several broad areas of individual level traits. For example, some scholars in the dynamic capability stream have studied and pointed to the importance of knowledge and managerial competence implications (e.g., Hou and Chien, 2010); While other scholars have examined the dynamic capabilities role in the development of innovative related operational capabilities (Ellonen, Jantunen, and Kuivalainen, 2011).

At an individual level specifically, there have been both conceptual and empirical academic papers centering on the micro-foundational work on managerial skills, leadership and other individual attributes (e.g., Abel, Felin and Foss, 2008; Ethiraj, Kale, Krishnan, and Singh, 2005). Although, the study takes an aggregated view of resources and capabilities, it is important however to note that there has been considerable recent focus on managerial competencies and capabilities in the dynamic capabilities and dynamic managerial capabilities stream research literature (e.g., Kor and Mesko, 2013; Lo, 2012; Ludwig and Pemberton, 2011; Martin, 2011; Yien, Chen, Huang, and Huang, 2011). This disaggregated approach or stream of the RBV has investigated and uncovered the importance of micro-foundations of managerial cognition on capability development (Laamanen and Wallin, 2009).

The study examines the similar issues around micro-foundation of the RBV on embedding and resource development at an aggregated level focusing on human capital in particular. The disaggregated approach or dynamic capabilities stream contributions are never-the-less important to the over-all understanding of resource

development. The dynamic capability stream is discussed in more detail in chapter 3, sections 3.6).

1.3.2 Individual Level Focus of Study

There has been some focus on the Individual-level, rather than organizational-level, human capital development through training, multi-skills and multi-competency by scholars and institutional committees for decades (e.g., Commission on the Future of Health Care in Canada, 2002; Fottler et al., 1988; HHMI Expert Committee Report, 2009; Siddiqui and Kleiner, 1998). Proportionally, this individual level focus has been more limited in the RBV literature. The recent decade has seen a drive to fulfil the recommendations for a Canadian national strategy in Canada's health workforce on training, education and changing skills and patterns of practice given by the Commission on the Future of Health Care in Canada (2002). The study examines the management training, education and skills as part of the healthcare strategy in a knowledge intensive environment in Canada. It is a micro-foundation study that researches the evolution of embedding competency and confidence at the individual level through management training. The study data are derived from the self-rating measurements of medical professionals. The goal of academic research is to draw inferences relating to factors that affect the outcomes as concluded from multiple empirical observations (Grant, 2007). This study deals with empirical data that attempts to structure some of the vaguer concepts and intangible resources prevalent in the RBV. Greater empirical research forms the scientific foundation for conceptual and theoretical papers in strategic management (Schendel and Hofer, 1979). This suggests that most scholars agree that strategic management literature and papers need to be 'First, more empirical …since we do not want for theories, but we do want for theories that have been adequately tested against empirical data' (Schwenk, 1982: 213). The theories, in fields such as strategic management, need to be tested against the empirical data (Schwenk, 1982)

In the RBV literature, the terms resources, competence, and capabilities have all been used to describe relevant attributes of physical, financial, organizational and

human resource bundles (e.g., Prahalad and Hamel, 1990; Stalk et al., 1992). The distinctions between the terms competence, resource and capabilities can be explored and laid out in theory but are vague and obscured in practice and not much value to managers or firms (Barney, 1991). Since the 1980s the importance of competence has been linked to human resource development and its association with education and training (Meriot, 2005). In much of the RBV and related literature stream, competence has been analysed and discussed at a firm level by scholars (e.g., Barney, 1991; Prahalad and Hamal, 1990; and Chen and Chang, 2010). The empirically driven contribution of this study focuses on the development of human capital resource.

The measurement of competence of individuals or groups can be done by either through perceptions of others or through self-reporting. The literature has tended to employ either the 360 degree or multiple-rating system (e.g., Bailey and Fletcher, 2002; Cheung, 1999; Mabey, 2001, 2005; Yammarino and Attwater, 1997). The idea for multiple raters was derived to obtain multiple ratings and perceptions from several sources or people (e.g., supervisor, manager, co-worker or external observer). There are alignment and calibration challenges and limitations to this method because of the different human perceptions to the scales and observations. Human perceptions, being less tangible measurement, can vary from individual to individual. The use of self-reported measures is one of the methods to understand competence at an individual level.

As noted, the focus is on identifying measurable, quantifiable, performance metrics related to self-reported human competencies. Specifically, the (individual-level competency) properties of human capital resources for medical professionals are measured through self-reported ordinal scale rankings. These measures, therefore, represent properties of human capital development. The difference in the competency rankings may be indicative of competitive advantage through value creation. The resulting contribution for the study is a methodological framework for identifying and quantifying properties of unobserved intangible assets for empirical testing of intangible human capital resource development.

Main micro-foundation focus is to investigate the embedding process of individual level traits through management training and education in building managerial attributes and capabilities as part of firm's human capital, as framed in the RBV.

Specifically, this is done through focusing on the differential impact of diverse methods of management training and education on clinical and management tasks in the knowledge-intensive health care industry. Subsequently, the different methods of embedding the human capital resource bundle are compared with self-reported competence rankings of the respondents with regard to clinical and management tasks. The central research question of the study, set in the Canadian health-care sector, reflects the importance of the broad themes of micro-foundation and of the process of human capital development, metrics and measurements. As discussed earlier in chapter 1 (1.3.1), the study, considers human capital in the broader perspective of the RBV, as an aggregate of the individual level attributes of knowledge, skills, competency, confidence and managerial capabilities. Hence the research focus and central questions are:

Empirically:

1. What is the relationship between management training and education and the embedding of individual level attributes in human capital resource development?

2. In the development of human capital as part of resource development, how do different types of management training and education affect the individual attributes of medical professionals as self-reported through ratings of confidence and competency in the discharge of managerial tasks by individual practitioners?

- and in final analysis and conclusion,

3. Are the empirical results obtained in the medical healthcare setting, examining the process of embedding individual level attributes through management training and education to develop the resource bundle, consistent with the VRIN criterion as advocated by the RBV?

1.4 Overall Summary of Objectives and the Framework of the Dissertation

The summary and visual framework of the dissertation can be observed from figure 1.1. The steps include the following:

1. First, focus on embedding intangible attributes in the human capital resource bundle.

2. Second, examine the aggregate (competence, resource) and disaggregate (dynamic capabilities) aspects of developing the individual resources in a firm.

3. Third, examine the specific ways in which different types of management training and education (formal and informal) play a role in competence (confidence) development.

4. Fourth, develop an empirical self-reported ordinal rank survey on the level of competence (confidence).

5. Fifth, the survey questionnaire examines the level of competence (confidence) of medical professionals with regard to identified clinical and management tasks.

Figure 1.1 Summary Framework of Study

1.5 Competitive Advantage and Economic Value or Net benefit: An Efficiency-Based Explanation of Performance Differences

Superior economic value leading to competitive advantage is derived from 'unique and superior competence' or resource (Collis, 1991: 51). Superior critical resources are described as resources or factors that affect economic cost (leading to lowering cost) or perceived benefits (leading to higher benefit) (Peteraf, 2001; Wernerfelt, 1989). These critical resources generate greater value, which is a competitive advantage, in that there is more residual value or return above the opportunity cost of resources (Peteraf, 1993, 2001). The competitive advantage in terms of heterogeneity advocates that the firm's resource bundles are different in terms of

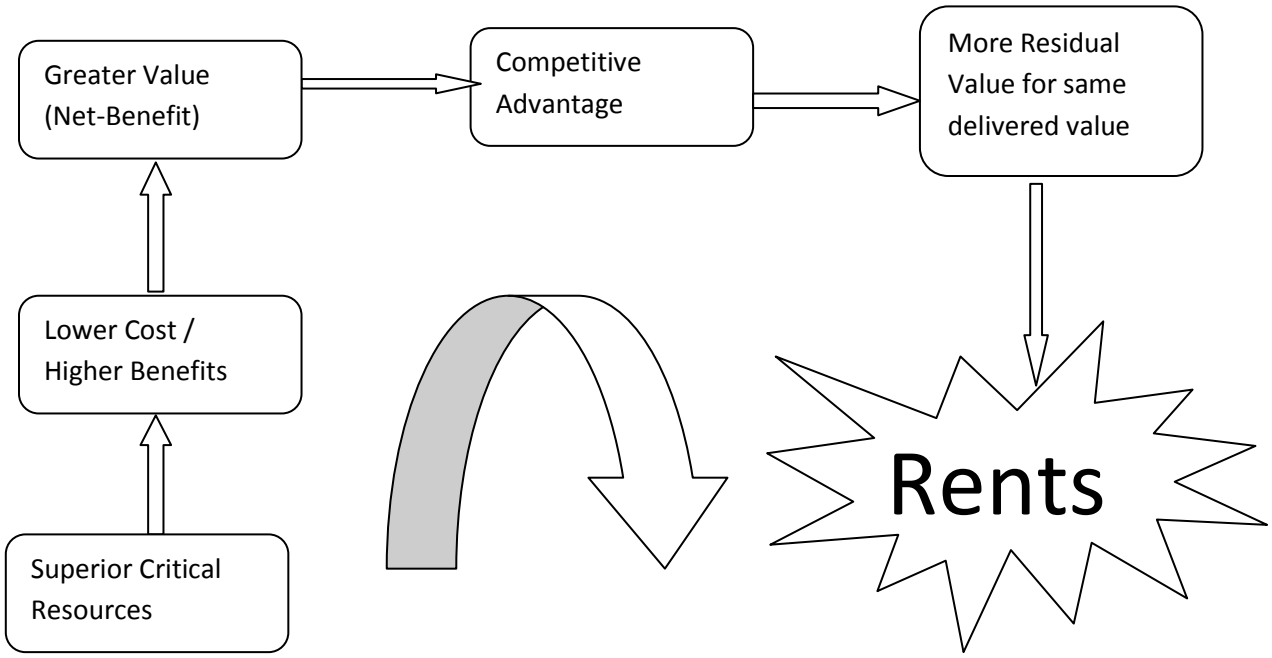
efficiencies, which in turn leads to different levels of generation of value Peteraf (1993). The greater value (generated from the efficiency difference of the resources a firm uses) is the derived rent (Peteraf and Barney (2003). This rent does not necessarily lead to superior profit for a firm, highlighting the point that there is no compulsory connection between economic rent and superior profit (Peteraf and Barney, 2003). Economic rent is explained in more detail in figure 1.2.

In summary, figure 1.2 describes the flow from resources to rents:

Figure 1.2

The Process of Deriving Rents from Resources: Peteraf and Barney's (2003) The Chain of Logic from Resources to Rents

Peteraf and Barney's (2003) **The Chain of Logic from Resources to Rents**



(Source: Peteraf and Barney, 2003: 316)

Hence for Barney and Peteraf (2001):

- The excessive residual value (what is left over after the consumers have been allocated the share of the total value) is equal to the economic rents.

- These economic rents are attributable to the more efficient factors of a firm.

The explanatory links between performance, economic value creation and competitive advantage are inherently complex and vague, especially when quantifying the performance measurements of intangible competencies, capabilities and resources for human capital attributes. Figure 1.1 illustrates the chain of logic beginning from the development and embedding of a superior critical resource bundle in the firm, which leads to lower cost/higher benefit (Peteraf and Barney, 2003: 316). This net benefit, or greater value derived from the embedding process, is seen as a source of competitive advantage that delivers more residual value for the same delivered value (Peteraf 1993). The chain's last link is the rent, which may or may not lead to superior profit—often a much more complex issue (Peteraf and Barney, 2003). The related introduced terms in figure 1.1 (e.g., cost, benefit, value, embedding, and competitive advantage) are just a brief introduction and will be discussed and expanded on in the later in context of the RBV of the firm and Canadian healthcare setting chapter 3 and 4.

In order to show net benefit or economic value based on the efficiency model, the study seeks multiple empirical observations through the self-reporting of individual competence. In this endeavour, the research dissertation quantifies the level of self-reported competence or developed resource linked to performance differences as an attribute of the human capital resource. The self-reported competency differences achieved through human capital resource development from the various types of training indicate an economic value or net benefit created based on efficiency considerations.

1.5.1 Human Capital Resource and Competitive Advantage

To gain a sustained competitive advantage, the resource must be scarce and difficult to imitate (Barney and Clark, 2007). These two important attributes of the intangible human capital resource lead to performance differences through economic value creation or net benefit observed. This net benefit or created

economic value achieved from the development of human capital leads to the inter-firm competitive advantage based on the efficiency considerations.

1.5.2 Rare Resources

One of the key requirements of a valuable resource is that it is rare and is a source for economic value or net benefit leading to a competitive advantage. In medical management, the lack of multidisciplinary training is observed in that '…most physicians receive no formal training in medical administration and management because changes in medical school and residency education have lagged behind changes in clinical practice and reimbursement' (Lane and Ross, 1998: 229). The literature, medical school curriculum and present collected data all indicate that management training as part of the human resource capital attribute is relatively rare. There are no long formal class programs in medical schools that train or teach physicians in management education. There are slots offered for joint degree programs offered by some universities, for example an MD or MBBS with an MBA, but the data collected indicates low numbers of physicians with formal management training (e.g., MBA trained).

1.5.3 Imperfectly Imitable

The developing RBV theory supports the premise that a firm or an organization will gain a competitive advantage if it pursues a strategy that is not currently being implemented by other firms or organizations in their industry (David, 2007). Training for medical professionals (physicians) may appear to be easily imitated, but there are challenges to the implementation. There are three obstacles which makes imitation difficult:

- First, the lack of time, as perceived by the physicians. This has been stated, from the present research findings, as the biggest hurdle—prioritizing the little time available after the clinical tasks.

- Second, the lack of perceived value of multidisciplinary, management education to the curriculum or post-graduation education. This perception may be due to the lack of empirical research on the importance and possible links.

- Third, the lack of organizational culture of placing greater priority on incorporating management education and training. The investment required in training is substantial and requires a great deal of the firm's or organization's commitment.

1.6 Research Approach

This research embraces the view that it is possible to deduce a testable empirical assertion from the RBV (Barney, 2001). The argument advanced here is that individual self-reported competency differences offer a means for gauging the development of internal resource bundles. This does not directly equate to collective, organizational or embedded resource bundles but might be thought of as the first step in such a process. Further, individual, self-reported data does not equate to competitive outcomes, but again might be regarded as a necessary pre-condition for such outcomes. This is based on the notion that the gain in economic value or net benefit through developing rare and difficult-to-imitate competencies or resources positively impacts on competitive advantage (Barney, 1991, 1997). The research process was a combination of empirical field research and iterative feedback to the existing literature in the areas of focus; broadly examining citation (rankings) count and overlap of seminal and current scholarly contributions in core subject journals (Summers, 1984).

1.7 Measurement of Self-reported Individual Level Competency

As noted earlier, the investigation of competiveness through development of intangible human capital resources has been conceptually discussed in the RBV literature with limited empirical support for the process and outcome. The difficulty relates to identifying aspects of less tangible human capital resources that reflect differences in performance. There is as yet no evidence that these quantifiable performance differences lead to significant value creation or to

competitive advantage gained for the firm. Self-reported competency and confidence are used to assess the impact of management education or training. The study explores the evidence of greater self-reported confidence and competence through management training which is helpful to understanding the development process of human capital resource.

Human capital resource development is observed by quantifying individual level human competency (confidence) attributes. The differences in self-reported competency indicate development of increased operational capability or human capital resource development through various modes of training and management education for managers/clinicians. This study identifies a possible qualitative approach to identifying aspects of human capital resources and the relevant skills and tasks for a firm—in this case, health care organizations. Empirically, these self-reported indicators can be quantified and measured to demonstrate performance differences. This supports the premise that competitive advantage for a firm is achieved through intangible resource development as indicated by the value created or net benefit attained.

1.8 Competitiveness and the Canadian Healthcare System

The Canadian healthcare system is an ideal setting to investigate the development of human capital in the quest for greater competitiveness. Canada is a vast geographic country (second largest by land mass in the world) with a population of over 32 million people (Thompson 2010). The Canadian healthcare system is a fusion of federal, provincial and private collaboration. The system is largely publically funded (70%) through a federal/provincial agreement, administered provincially, and operated privately at individual or firm level (Barenak et al., 2010). There has been an extensive discussion on developing human capital to enhance competitiveness in the Canadian healthcare system (Kabene, 2006; Laroche et al., 1999; Romanow, 2002). In the Canadian health care system, the medical professionals (physicians) are an important part of the healthcare setting and ideal subjects for the study of human capital development at an individual level of focus. In Canada, the collaborative approach to healthcare is an important

driver for achieving a greater level of competitiveness through human capital development. The individual level strategy for achieving competitiveness is done by focusing on multidisciplinary training and education for medical professionals (physicians) in the healthcare system and resource management (Drummond, 2012).

There has been a growing exploration and analysis of competition in the publicly funded, but privately operated and administered healthcare systems (e.g., Romanow, 2002; Woolhandler and Himmelstein, 2007). The Canadian healthcare system is a highly knowledge intensive arena. It is an ideal area to study human capital development (Arya, 2007; Graham and Tetroe, 2007). The drive for competitiveness and formulation of strategies, in this knowledge intensive system, stems from several sources (D'Amour et al., 2008; Flood and Archibald, 2001). First, there is an interprovincial and a national competitive drive to contain cost, improve quality and enhance the overall value or net benefit given to patients (Denis, 2002; Romanow, 2002). Second, as mentioned before, although the majority of funding is coming from the federal and provincial governments, the hospitals, clinics and other healthcare institutions are managed at a private level where the healthcare is delivered (Deber, 2003). In private management, there are guidelines of fees and caps set by the provincial governments but the physicians have the legal freedom to opt out of the system and charge on a private basis. This creates competitive pressures for public and private system to operate more efficiently and deliver higher net benefits (Flood and Archibald, 2001, Romanow, 2002). Third, each healthcare firm, regardless of the funding, is administered privately on a fee for service basis competing against each other to attract patients, deliver quality service and reduce costs (Flood and Archibald, 2001). The complex, dynamic and highly knowledge intensive Canadian healthcare system setting is explored and discussed in much more detail in chapter 4.

1.9 Overview and Format of Thesis

The following next three chapters present the aim and hypothesis of the study, develop the research framework, and review past and current work in the literature. Chapter 2 explores the RBV in the wider strategic management field and

the important concepts of strategy and competitiveness. The in-depth discussion and examination of the RBV of the firm is done in Chapter 3. This is followed by chapter 4, which is an overview of the research setting. In this chapter the knowledge intensive Canadian healthcare environment is investigated with respect to competitiveness. Once the study is framed in terms of aim, gaps in the literature and set in the broader context of setting and theory, the next chapter (5) is focused on the research design strategy taken for the study. The ontological, epistemological, and methodology considerations are discussed and positions taken for the study. The chapter outlines the mixed methods approach taken in the study and the techniques of data collection and analysis. The following two chapters (6 and 7) deal with the pre-requisite development of the survey (through a pilot study) used in the study and the results and analysis of the questionnaire respectively. The results and findings are presented descriptively and inferentially to answer the research question with the appropriate statistical test. Finally, concluding chapter (8) examines the findings with respect to the mid-theoretical level contribution, limitations and future direction for further research.

Chapter 2

Competitive Strategy and the RBV

2.1 Introduction

The purpose of chapter 2 is to examine the RBV and the concept of strategy in the context of the strategic management field. The review which follows takes an in-depth examination of the origins of strategy and the strategic management field. This is accomplished by outlining the various schools of thought of strategy and field of strategic management and their relationship to the RBV. The chapter provides the broader perspective of the resource-based view as it fits into strategy and the strategic management field. This wider context helps to illustrate the basis for the weaknesses and gaps in the RBV literature that mirror similar terminology and multidisciplinary contribution problems in the development of the strategic management field. The competitive strategy literature is investigated, and the distinction between internal (firm-level focus) and external (market-level focus) perspectives is presented. Finally, the chapter focus is set on RBV strategy as part of the competitive school of strategic management

2.2 Origins of the RBV Perspective in the Field of Strategic Management

The last half century has seen an accumulation of a large body of work in the study of competition, with a growing focus on the acquisition, development, renewal, and adaptation of resources, competencies and capabilities. Earlier, the conceptual works of Andrews (1971), Ansoff (1965), and Learned et al., (1969) centred both on the internal strengths and weaknesses of a firm and on the opportunities and threats in the external environment. In the early 1980s, this focus shifted to the external market or industry analysis approach, following the contribution of Michael Porter. This outside-in approach was based on generic strategies to gain a strategic competitive advantage (Porter, 1980).

2.2.1 External to the Firm: Industry Approach

The shift to and embrace of the external perspective in strategy analysis in the field of strategic management and industrial economics occurred with Porter's (1980, 1998, and 2004) influential contribution of generic competitive strategies of differentiation, cost leadership and focus (Miller, 1988; Ormanidhi and Stringa, 2008). The other models for competitive advantage were based on the national and industry-level analyses of Porter's Diamond and Porter Five Forces, respectively (Jelenc, 2009). These significant contributions in competitive strategy as a zero-sum game by Michael Porter (1980, 1985) viewed the firm as 'surrounded by suppliers, customers, competitors, and substitutes, engaged in a battle with them to capture the maximum economic value possible' (Bartlett and Ghoshal, 2002: 36).

Porter (1980) focused largely on the external environment—more specifically, the industry a firm was in—to analyse competitive strategy. Porter's (1980: 4) model identified five competitive forces that affect all firms' standing in 'profit potential...or long run return on invested capital'. Porter's corporate competitive strategy focus was on how the company faced the threats and opportunities in the surrounding environment. In analysing the various industries, the differences in the 'profit potential' were affected by the intensity of competition relating to the five forces (Porter, 1980: 3–5).

Porter's (1980: 4–6) five identified competitive forces are the following:

1. Bargaining Power of Buyers
2. Bargaining Power of Suppliers
3. Threat of Potential Entrants
4. Threat of Substitution
5. Industry Current Competitors (Rivalry)

In the context of developing a competitive strategy, Porter (1980: xvii–xviii) outlined the limits as set by four factors of the external environment framework that determine what a company is able to successfully adopt and achieve:

The internal limits: 1. Company's strengths and weaknesses

2. Personal values of the key implementers

The outer limits: 3. Industry opportunities and threats (economical and technical)

4. Broader societal expectations

Porter (1980: xviii)

These contributions in the relatively young field of strategic management helped to develop analytical frameworks in the competitive school and had great impact and influence far beyond for academics and practitioners alike (Stonehouse and Snowdon, 2007).

It was not until the mid-1980s that the focus shifted once again, this time towards an internal perspective. In the latter part of the 20th century, the conceptual developments of the SWOT analysis and external generic strategies approach in strategic management were challenged and to some extent superseded by the popularity of the competency (e.g., Hamel and Heene, 1994; Mooney, 2007; Nordhaug, 1994, 1998; Sparrow, 1994; Ulrich and Lake, 1990) and resource-based perspective contributions (e.g., Barney, 1986, 1991; Dierickx and Cool, 1989; Grant, 1991; Rumelt, 1984; Wernerfelt, 1984).

2.2.2 Internal Firm Approach

The external, industry, approach focus dominated the strategy discussion until the closer examination and popularity of resource-based view publication by Wernerfelt (1984) and further contributions by other scholars (e.g., Barney, 1991; Dierickx and Cool, 1989, Peteraf, 1993). The redirect, focused the attention on the firm's competitive position, recognizes the resources rather than the external market environment as the important antecedent to superior performance (Dierickx and Cool, 1989). This view allows managers to look beyond the forces in the

environment to the development and manipulation of a firm's resources, capabilities and relationships as a strategic asset to gaining competitive advantage (Barney, 1986, 1991; Dierickx and Cool, 1989; Wright, McMahan, and McWilliams, 1994). The internal firm focus of the study is investigated at the individual level. This internal approach is explored and discussed in-depth in chapter 3.

2.3 Resource-Based View and the School of Competitive Strategy

The critics of the resource-based view (e.g., Foss et al., 2008; Foss and Knudsen, 2003; Makadok, 2001b; Priem and Butler, 1999; Spender, 2006), as previously discussed in sections 1.1 and 1.2, have challenged the conceptual foundation and questioned the usefulness of this view in the strategic management literature. For this reason, it is helpful to begin with a better understanding of strategy and field strategic management and how the resource-based view is positioned. The focus on competiveness in the resource-based view has emerged as an important part of the competitive strategy school in the field of strategic management. It is important to understand how this area has become so widely studied by scholars from the external and internal level of focus. The developing academic field of strategic management has its origins in practical applications and business policy studies and practices (Barney, 1997; Harrison, 2003; and Teece, 2009). Although there may have been some overlap of practice and theory in this period, the learning in the business field began in a prescriptive nature. The consulting and academic research in the field of strategic management developed from work in the 1960s and their application to management in the following decade (Rumelt et al., 1991). Prior to the introduction of 'Strategic Management' as a field, 'Strategic Planning' (coined by Ansoff in the 1950s), which dealt with strategy formulation, was the popular topic for academics and practitioners in business in the 1960s and 1970s (David, 2007: 5; Hussey, 1999: 380–382). The contributions of Chandler (1962), Ansoff (1965) and Andrews (1971) helped to develop and shape the emergent stages of the field (Pettigrew et al., 2002). It was Igor Ansoff who formally introduced the concept of strategic management in 1972 in an academic article published in the *Journal of Business Policy* (Hussey, 1999). This view expanded on the 'art and science' of strategy formulation and includes 'implementing, and evaluating cross

sectional decisions that enable an organization to achieve its objectives' (David, 2007: 5).

It could be argued that Strategic Management is still one of the 'least developed and the least mature' field in the business literature and school curriculum (Barney, 1997: vii–viii). Strategic management is defined historically in the practice related to the strategic direction of a business, which is central to wealth creation (Rumelt et al., 1991). Strategic Management is concerned with understanding the processes of how an organization achieves success and is able to sustain it (Wheelen and Hunger, 2004). The precise definition of strategic management over the years has evolved with the differing developing perspectives. Along with the paradigms chosen, there are other frameworks and schools of thoughts that help to describe the field of strategic management. There isn't a clear consensus on the broad body of research with various perspectives or schools of thought (Jelenc, 2009).

Ansoff (1987) conceptualized strategic management as organized in a similar frame to the framework put forth by Thomas Kuhn (1970) in his book, *The Structure of Scientific Revolution*. Thomas Kuhn (1970: 177), described the scientific community as having shared or unified assumptions, beliefs, models and approaches. Thomas Kuhn (1970) challenged the premise that scientific progress follows a linear building block format, instead supporting the scientific revolution path in which the scientific community embraces a new shared belief system or 'paradigm' (Kuhn, 1970: 177). In the emerging field of strategic management, a framework had to be either developed or modelled on existing ideas from prior conceptualizations. Ansoff (1987) used Kuhn's (1962) Scientific Revolution model on paradigm shift theory to examine the building and transformation of research in strategic behaviour and the emerging paradigms. Ansoff (1987) likewise, challenged the notion that progress in the conceptualisation of strategy was more than just a sequential accumulation and building on prior work of concepts and theories in a single paradigm model but interactive in seeking common grounds in contradicting theories. This approach, in the study of strategy, advocates there are periods of shifts in which the introduction of new paradigms, elements of the scientific revolution, are brought enhanced by the examination of complementariness of

competing theories and increased multi-disciplinary research (Ansoff, 1987; Jemison, 1981). This was an important contribution to the formal organization of strategic management research and the understanding of this developing field. On-going contributions of accumulated data and literature still need to be organized according to the various paradigms. The combined artistic and scientific nature of the field has inevitably opened up numerous concepts of strategic management in the literature since Ansoff's contribution. There have been a number of attempts by scholars (e.g., Jelenc, 2009; Mintzberg, 1988; Whittington, 2000) to divide strategy and subsequently strategic management into different schools of thought. Examples of the various classifications include Mintzberg's (1998) ten schools of strategy formation (design, planning positioning, entrepreneurial, cognitive, learning power, cultural, environmental and configuration) and Jelenc's (2009) schools of strategic management (classic, contemporary, competitive, and environmental). The various classifications and schools are discussed here for two reasons; first, to set the context and origins of the terminology used in the RBV conceptually in the broader strategy and management fields. Second, to help focus the study with respect to previous scholarly contributions derived from various concentrations of strategy and strategic management schools which helped in developing and differentiating the RBV.

The focus of strategic management schools is influenced by the corresponding paradigms they are set in. An aggregated view of strategic management derived from these concepts encompasses those decisions, actions, dealings and investments that determine a firm's performance (Wheelen and Hunger, 2004). This includes learning from the external and internal environment, strategy formulation, evaluation, strategy implementation, and analysis and controls (Harrison, 2003; Wheelen and Hunger, 2004). In a disaggregated format, strategic management may be viewed from various perspectives.

2.4 Competitive Paradigm in Strategic Management

The RBV focus is most closely aligned to the 'competitive school' because the focus is on the firm's use of resources to gain competitive advantage. Two popular approaches in the competitive school of thought are the traditional economic and the resource-based perspectives. The difference between the two is the manner in which the firm is viewed and the strategy is formulated. In the first, the firm is viewed as an economic entity in which analysis of the internal and external environment plays a role in strategy formulation (Harrison, 2003: 6). In the second, RBV, the firm is viewed as a collection of skills, resources and capabilities in which the analysis and acquisition of these valuable resources, skills and capabilities play a role in strategy formulation (Barney, 1991). These perspectives have some conceptual and framework overlap that may be seen as complementary. There is a cross pollination of ideas, concepts and terminologies. The perspectives in the competition school of thought envelop both internal and external forces for the firm (Porter, 1980). For example, the RBV perspective has been developed with elements of the economic concepts. An in-depth examination of the RBV perspective shows the adoption of both hard tangible and softer intangible resources and capabilities (Barney, 1991; Barney and Clark, 2007; Bromily, 2005; Teece et al., 1997; Winter, 2003). There are various perspectives, concepts and terminologies from numerous scholars, but the focus in the RBV remains on a firm or organization gaining a competitive advantage through differentiation which ultimately impacts performance (Barney, 1991; Porter, 1980; Rumelt et al., 1991; Teece et al., 1997).

The competitive classification in strategic management has a variety of influences from many scholars. The authors take various perspectives and focuses to help explain competition in gaining and sustaining a competitive advantage over rivals. From the great number of scholars, some of the prominent names in this arena are Knight (1921), Schumpter (1934), Penrose (1959), Drucker (1970), Porter (1980), Teece (1980), Rumelt (1984), Wernerfelt (1984), Barney (1986, 1991), Prahalad and Hamel (1990), Grant (1991) and Teece et al., (1997). The phenomenon of competition is examined from the different concentration or focus such as

economics, entrepreneurship, leadership, resources, capabilities and behaviour. Competition and achieving a competitive advantage are the two most important features of the paradigm regardless of the focus (Jelenc, 2009).

2.5 Internal Firm-Level Focus

As previously discussed in sections 2.2.1 and 2.2.2, there are two levels of focus in competitive school of thought. Among these various perspectives, these two subdivisions apply to developing, gaining, and sustaining a competitive advantage. The two divisions, either external or internal, are based on different focuses of the same phenomena of competition. The study explores human capital development at an individual level strategy of a healthcare firm in achieving a sustained competitive advantage through the internal lens.

2.6 Strategy: Development and History

Historically, strategy was associated with Ancient Greek military thought, and became increasingly applied to the rivalry in the capitalist marketplace. The central question for strategy in business revolves around 'why firms succeed or fail' (Porter, 1991: 95).

2.6.1 Military Strategy

Strategy has its roots in Greek military thought for addressing problems on the battlefield (Mintzberg, 1989: 27). The word strategy derives from the Greek word strategos, combining 'stratos' (for the army) and 'ago' (to lead) (David, 2007: 26, Webster's New World Dictionary), meaning general. Strategy is a complex concept with multiple uses; it, 'spanned and germinated across such disciplines as political science, organizational theory, military science and business policy' (Fomburn and Astley, 1983: 47). Terms such as the use of one's strengths, exploiting the weaknesses of a competitor, gaining competitive advantage, and concentrating on the internal and external environment and conditions are relevant in both the military and business fields (David, 2007). This multidisciplinary terminology and

concept resulted in an enormous amount of literature from many notable scholars in various fields of study.

2.6.2 Business Strategy

Strategy in business has its roots in the important contributions of, for example, Andrews, 1980; Ansoff, 1971, and Chandler, 1962. Various academic styles have contributed to the countless definitions of strategy which differ according to the perspective or phenomena one is focusing on (Barney, 1997, Mintzberg, 1988). In an early definition, business strategy was defined as 'the determination of the basic long-term goals and objectives of an enterprise and the adoption of courses of action and the allocation of resources necessary for carrying out these goals' (Chandler, 1962: 13). In another definition, Strategy is described as 'the pattern of objectives, purposes, or goals and the major policies and plans for achieving these goals, stated in such a way to define what business the company is in or is to be in and the kind of company it is or is to be' (Andrews, 1971: 28).

Many of these definitions in the vast strategy literature, by various authors, employ one or more aspects of Mintzberg's definition, depending on the phenomena they are focused on.

> Mintzberg takes five different approaches to defining strategy: a plan, ploy, pattern, position, and perspective (Barney, 1997). Hence for Mintzberg (1987: 11-16) strategy is defined in terms of:

- *Plan: 'a consciously intended course of action, a guideline (or a set of guidelines) to deal with a situation'*
- *Ploy: 'a specific manoeuvre intended to outwit an opponent or a competitor'*
- *Pattern: 'a pattern in a stream of actions...consistency in behaviour'*
- *Position: 'a means to locating an organization in...an environment'*

- *Perspective: 'looks inside the organization...ingrained way of perceiving the world'*

These definitions are important to the RBV in examining how a firm gains competitive advantage by looking at strategy in one or more of the five ways that Mintzberg (1987) has proposed. The strategy approaches can be highlighted from an internal perspective and in terms of competition in the ploy approach for strategy. The study examines the various forms of strategies in helping to understand competitiveness.

The concept of strategy in strategic management has been developing since the start of teaching managers in professional schools of management, especially since the beginning of the 1960s (Andrews, 1980: iv, v). The early beginning of the study of firms and their management produced many noteworthy scholars, among them, Ansoff and Chandler. They made significant contributions to the concepts in a new field and the documented historical development as it related to firms. In the practical business world, the concept of strategy defined as 'the new decisions, rules and guidelines, which guide the process of development of an organization', has become an intricate part of the planning and decision-making apparatus of mid-size and large firms in the last 60 years (Ansoff, 1965: 75). This need for application to the practical and the theoretical conceptual development has been at the heart of which type of research should be pursued in strategic management.

Much of the historical nature and development of strategies taken by large American firms in various sectors, including multi-industry firms such as chemical and automobile companies and single-industry firms such as steel and oil companies, was well documented by Chandler (1956). An in-depth historical perspective of a large vertically integrated organization, General Motors, under the leadership of Alfred P Sloan Jr., was analysed by Chandler in the publication, '*The Visible Hand'* (Ansoff, 1988: Langlois, 2004: 355).

The specific perspective on the contribution may be viewed from various broad academic styles. Bowman et al., (2002) viewed the concept of strategy as evolving in three broad academic styles: institutional, economic and behavioural. Hence, for

Bowman et al., (2002), the three styles were highly influenced at various times by different scholars:

- The institutional style contribution of scholars (e.g., Chandler, 1962; Mintzberg, 1978; Pettigrew, 1987; Quinn, 1980; and Rumelt, 1974) in the sixties and seventies examined top managers in the field working in organization such as General Motors.

- The economic style contribution of scholars (e.g., Camerer, 1985, 1991; Dixit and Nalebuff, 1991; and Saloner, 1991) in the seventies and eighties concentrated on industrial organization economics.

- Finally, the behavioural style multi-field contributions of scholars (e.g., Argyris, 1985; Burt, 1997; Granovetter, 1985; Hannon and Freeman, 1977, 1989; Pettigrew, 1987; Porac and Thomson, 1990; Tversky and Kahneman, 1986) focuses on the organization and behaviour of people and networks.

The study examines the human capital from a combination of these contributing perspectives. All three aspects are considered in terms of embedding individual level traits or managerial competencies, which the RBV advocates lead to competitive advantage for the firm. The style of contribution can vary because the concepts that are central to one perspective (e.g., competitiveness, resources, and competencies) can be relevant to one or more style of contribution.

2.6.3 Corporate Strategy

Richard Whittington (1993) provided sociological practice emphasis examples of a model of strategy for a corporation based on processes and outcome dimensions. These typologies and framework types are understood based on the various definitions of terminologies related to strategy and strategic management. Kenneth R Andrews defines corporate and business strategies separately.

For Andrews (1980: 18):

'Corporate Strategy is the pattern of decisions in a company that determines and reveals its objectives, purposes, or goals, and defines the range of business the company is to pursue, the kind of economic and human organization it intends to be, and the nature of the economic and noneconomic contribution it intends to make to its shareholders, employees, customers, and communities'

Corporate strategy was a top-down approach to looking at planning and implementation for a firm. Some of the early contributors in the mid-20th century included scholars such as Christensen, Berg, Salter and Stevenson (1951), Selznick (1957), Chandler (1962), Ansoff (1965) and Learned et al., (1965), all of whom helped to explain strategy in the internal and external context for a firm. The internal /external explanation developed when strategic management was still new and a subsection of Business Policy (Jelenc, 2009). One of the first attempts at a sound and formal analytical layout of corporate strategy was put forth by Ansoff (1965) in his publication, *Corporate Strategy* (Hussey, 1999: 379). Ansoff (1965) laid much of the groundwork for formal analytic tools for strategic decision making and planning along with an introduction of a natural science concept of synergy to be used in business strategy. In an attempt at organizing and aiding the human cognitive process, Mintzberg (1990) introduced the 10 schools of strategy formation, which included the schools of design, planning, positioning and so on. These conceptual and framework contributions on strategy as it relates to the firm or organization built upon the historical scaffolding of the newly developing field of strategic management.

2.7 Strategy and Strategic Management: From an RBV Perspective

The concept of strategy in business may be further refined to reflect a particular perspective, such as the resource-based approach. Strategy is viewed as a conceptual tool to gain superior performance, leading to value creation and hence a competitive advantage. In an internal perspective, from a firm-level analysis, the related concepts for Barney (1996: 27) are:

- '***Strategy*** is a pattern of resource allocation that enables a firm to maintain or improve its performance'

- 'A ***Good Strategy*** is a strategy that neutralizes threats and exploits opportunities while capitalizing on strengths and avoiding or fixing weaknesses'

- '***Strategic management*** is the process through which strategies are chosen and implemented'

2.8 RBV and Competitive Strategy

The study examines individual level embedding process which leads to competitive strategy for a firm from the RBV perspective. The RBV incorporates concepts from conventional strategy research (e.g., Andrews, 1971; Ansoff, 1965; Selznick, 1957), organizational economics (e.g., Barney and Ouchi, 1986) and is complementary to industrial organizational analysis (e.g., Caves, 1982; Porter 1980) while being a powerful source for vigorous dialogue and discussion in these areas (Mahoney and Pandian, 1992). This internal-level focus is important in corporate or business-level strategy analysis. The resource-based view in the corporate and business-strategy-level perspective focuses on the competitive advantage for a firm. As discussed earlier in section 1.1, the strategy for a firm to achieve competitive advantage lies primarily in the application of the bundle of productive resources it possesses (Barney, 1991; Barney and Clarke, 2007; Peteraf, 1993; Rumelt, 1984; Wernerfelt, 1984).

The RBV is considered good management science because it has generated much interest, dialogue and debate among scholars (Mahoney and Pandian, 1992). The resource-based view was not popular in the field of strategic management early on, as Wernerfelt (1995), himself admitted when reflecting on it 10 years after his seminal publication of 1984. Strategy from an internal firm view started to become mainstream after several more important papers on resources were published by scholars (e.g., Barney, 1986, 1991; Dierickx and Cool, 1989; Peteraf, 1993;

Wernerfelt, 1989). Its popularity and prominence continued to grow with the importance of corporate and business strategy research (Wernerfelt, 1995).

In summary chapter 2 developed and discussed the context of competitive strategy and the RBV in the field of strategic management. Chapter 3 contains an in-depth exploration of the RBV. The RBV is explored and discussed in detail from a historical perspective, seminal contribution, prominent critiques, gaps in the literature, offshoot streams, conceptual development and competence. It further differentiates the various types of resources, focusing on the human capital resource as a source of a firm's competitive advantage.

Chapter 3

3 The Resource-Based View of the Firm

3.1 Introduction

The purpose of this chapter is to introduce and discuss the resource-base view (RBV). The first section outlines the seminal contributions in the development of the view towards a theory, examining influences from various schools of thought in this development. This chapter also conducts an in-depth evaluation of the limitations and weaknesses of the RBV, followed by the identification of gaps in the past and current RBV literature. The latter sections examine the different streams emanating from the early contribution of Edith Penrose, such as dynamic capabilities and behavioural approaches to the RBV. Competence and intangible human capital is discussed and examined at the individual level in the context of a firm's resource development. Finally, this chapter discusses the self-reported survey research approach of the study in examining human capital resource development.

3.2 The RBV Perspective

The RBV model and developing theory advocates that the basis for strategy for a firm to achieve competitive advantage lies primarily in the application of the bundle of productive resources it possesses (Barney, 1991; Dierickx and Cool, 1989; Peteraf, 1993; Rumelt, 1984; Wernerfelt, 1984). The RBV takes firm level internal perspective to explain how a firm gains sustained competitive advantage over rivals (Conner, 2002). This contrasts with an external, market- or industry level view of competitiveness, perhaps most influentially advocated in Porter's five competitive forces framework which in turn draws a great deal from neoclassical economics (Maxfield, 2008). The RBV perspective has been influenced by several schools of thought, among them, the traditional, contemporary and competitive. In the Competitive School of Strategic Management, the developing RBV perspective takes aspects from economic thought in the traditional classical school of strategy as well

as from non-traditional multidisciplinary contributions of behavioural psychology and sociology.

Many scholars (e.g., Barney, 1991; Dierickx and Cool, 1989; Penrose, 1959; Peteraf, 1993; Priem and Butler, 2001a, b; Rumelt, 1984; Teece, 1998; Wernerfelt, 1984) have made influential conceptual contributions to the RBV in the past five decades. The wide dissemination of the RBV has permeated as a practical tool for mangers in industry and academic focus for scholars in exploring the relationship between a firm's resources and its economic performance (Hansen et al., 2004).

The success of a firm, as indicated by measures such as superior customer service, better efficiency, or higher economic gains, has been the central topic in the competitive school of strategy. In this stream, there has been a continuing challenge for scholars struggling to formulate a compelling and persuasive explanation of competiveness (Barney, 1991; Drucker, 1970; Penrose, 1959; Porter, 1980; Wernerfelt, 1984). The formulation of a compelling explanation has been difficult because of the diffuse and sometimes confusing terminology and concepts of the diverse perspectives and disciplines from which strategic management may be viewed (Priem and Butler, 2001a, b). The concepts of resources, competencies and capabilities in the field of strategic management are important building blocks leading to the development of the RBV. These concepts are vague and ill-defined in the literature (Priem and Butler, 2001a). The definitions and competing explanations of resources, competencies and capabilities are introduced in table 3.1.

Table 3.1

Concepts and Definitions of Resources, Competencies and Capabilities

Key Concepts	Definition(s) in the Literature
Resources	Penrose (1959) described a firm's resources using two terms: physical and human. Hence for Penrose (1959; 24,25): • Physical resources consist of tangible things such as 'plant, equipment, land and natural resources, raw materials, semi-finished goods, waste products and by-products, and even unsold stocks of finished goods'. • Human resources consist of 'unskilled and skilled labour, clerical, administrative, financial, legal, technical, and managerial staff'. Daft (1983) described firms resources as 'all assets, capabilities, competencies, organizational processes, firm attributes, information, knowledge, and so forth that are controlled by a firm and that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness' (Barney, 1997; 142–143).

	Hill and Jones (1992) define a firm's resources as made up of attributes derived from its financial, physical, individual and organizational capital
Competences	Selznick (1957) described distinctive competences as activities (derived from a combination of organizational vision and organizational structure) that a firm does better than any competing firms. Core competencies are described as being limited to internal attributes of a firm that enable managers to develop and implement corporate diversification strategies (Prahalad and Hamel, 1990). Barney (1996), in an aggregate definition of resources, considers competencies an attribute that is part of the firm's resource. Prahalad and Hamel (1990) take a disaggregate view of core competencies. These competencies are viewed at an organizational level.
Capabilities	Daft (1983) and Barney (1997), in an aggregate definition of resources, consider capabilities an attribute that is part of the firm's resource.

	Stalk, Evan and Shulman (1992) describe capabilities as internal attributes that enable a firm to direct and utilize its other resources. Winters (2003: 991) differentiates among the capabilities using terms such as 'zero-level capabilities', which permit a firm to make a living in the short term, and 'dynamic capabilities', which function to extend, modify or create ordinary capabilities. In this context, the patterning of activity and the investments required to develop and sustain such patterning of activity are the strategic substances of the capabilities.

Table 3.1 illustrates the messy and sometimes overlapping definitions which present challenges to consensus on the underpinning of concepts and the micro-foundations of the RBV. Some of the challenges and critiques of the developing RBV, as discussed later in chapter 3 (section 3.8.1), derive from the multiple streams, perspectives and disciplines that the RBV is studied. The lack of consensus and messiness of definitions and terminology is overcome in the study first examining the differences in strategic management. Second, focusing on the definitions and terminologies that are closely linked to the RBV, Finally, third, by taking an aggregate view of resources which encompasses capabilities and competencies under the broader resource term as Barney (1997) has done.

The resource-based view has become a central framework for explaining the success of a firm from an internal perspective (Conner 2002). As previously discussed in section 1.3, the valuable resources are resources that allow a firm to gain competitive advantage (e.g., increasing efficiency and/or effectiveness) (Barney, 2001).

3.3 Origins and Historical Development

The RBV, like many newer perspectives, conceptually borrows terminology from other fields. It has added to the building blocks of knowledge of seminal works and contributions of past scholars. As noted, In this perspective, a firm derives competitive advantage from the heterogeneity or the diverse distribution of resources, capabilities and competencies in an industry (Barney, 1997). This heterogeneity persists over time because the resources are distributed across competing firms and organizations and are imperfectly mobile or difficult to develop or acquire across the industry (Barney 1991; Mahoney and Pandian 1992; Penrose 1959; Wernerfelt 1984). The resources are imperfectly mobile, as noted in chapter 1, section 1.1, under certain conditions such as when they are specialized to a firm's specific requirement, when the transfer transaction cost are very high, (Rumelt, 1987; Williamson, 1975; and Peteraf, 1993). The immobility argument and premise for the RBV is discussed further in section 2.4.

The basic framework for analysis of an organization centres on resource attributes such as 'valuable, rare, imperfectly imitable and non-substitutable' (Barney, 1991: 117). It is the resource attributes that persuade the firm to choose a particular market to enter and influence its performance, as measured by profits (Barney, 1997; Wernerfelt, 1989). The framework has been enhanced further through multiple resource perspective streams. These are explored in sections 2.7 and 2.8.

3.3.1 Foundations of the RBV: Scholarly Contributions and Significant Figures

The studies of economics, distinct competencies and management capabilities have all contributed to the RBV (Harrison, 2003). These leading theoretical frameworks focus on either the firm's internal strengths and weaknesses or external

opportunities and threats (Wang and Ahmed, 2007). There has been much debate about placement of the RBV in the area of competition since its development and formal introduction in the strategic management field. The internal firm focus of the RBV perspective is seen as complementary to leading external theoretical frameworks in strategic management (Wang and Ahmed, 2007).

The study of firms focusing on the organizations' strengths and weaknesses has its early beginnings in the eastern coast of the United States. This firm-level analysis originated in the early 1900s, with Harvard Business School scholars focusing on the impact general managers had on firms' performance (Barney and Clark, 2007). Although, the early studies (e.g., by scholars such as AW Shaw, MT Copeland, George Albert Smith Jr., and Edmund P Learned) were a good beginning on the link of managers and firm (Learned et al., 1969); they did not take into account either the unique qualities of the general managers or the existence and importance of other firm attributes (Barney and Clark, 2007). One of these key attributes, firm growth, was the focus of work by Edith Penrose (1959).

3.3.2 The Theory of the Growth of the Firm (Penrose)

Edith Penrose's (1959) work on firm growth and expansion contributed to new perspectives in the emergence of organizational studies. For Penrose, the focus was on the internal perspective dealing with bundled resources at the firm level. Specifically, the internal focus was on the firm's administrative or managerial frameworks that combine and coordinate activities and the bundles of production resources (Penrose, 1959). The novel approach was intended to investigate the firm beyond the constraints of traditional economic models, which used neoclassical microeconomics assumptions (Penrose, 1959). Such assumptions framed the firms as simple production functions and focused on the supply and demand aspects in the market to set the level of production and maximize the firm's profits (Barney and Clark, 2007; Nelson and Winter, 1982). Conversely, Penrose saw the firm as an administrative organization that can recognize 'subjective productive opportunity' in its collection or pool of resources to accomplish aims or garner potential value (Penrose, 1995: 44).

The precise nature of Penrose's contribution has been a source of contention among scholars in the strategy and competition fields of study. The analysis of the contribution made by Penrose (1985: 6–7) indicates that investigating 'real' problems of market equilibrium and welfare maximization in standard neoclassical economics is possible and can be conducted through a combination of the internal perspective and an external view of the firm. Penrose's (1959) focus into the exploitation of firms' resources helped to lay the foundation for the further development of the RBV. Over time, opposing arguments regarding the intent and interpretation of the resource-based view and competitive advantage have emerged.

One interpretation or view by scholars (e.g., Rugman and Verbeke, 2002) contends that Penrose's contribution has been misinterpreted in that it does not provide a prescriptive framework for managers to develop or create sustainable streams of rents. In this view, there were no assumptions of rents occurring; and if they did, it highlighted the macro-level outcome inefficiencies or an efficient micro-level growth process (Rugman and Verbeke, 2002).

A contrasting point of view highlights that Penrose (1959) does provide the important causal links to organize the resources, capabilities and competitive advantage in the resource-based view (Kor and Mahoney, 2004: 184). Although the profit maximization pertaining to economic rents may not have been the strict framework of Penrose's (1959) argument, Kor and Mahoney (2004) argue that Penrose does make the assumption that managers are interested in profitable growth with her focus on the concepts of opportunity cost and economic profit. Two other points highlighted by Penrose in 1959 are discussed by Kor and Mahoney (2004): First, if a firm grows and expands in the presence of rival firms, the firm must believe it has some competitive advantage that will ensure the profitability of its investment (Penrose, 1959); and second, the firm's growth will be inefficient and unprofitable if there is no balance between the firm's rate of growth and the capacity of managerial services.

Although interpretations of Penrose's (1959) work are disputed, the importance and scholarly impact of the seminal contribution is clearly evident. The seminal ideas generated by Penrose have been cited and have contributed significantly to the literature on competition within the strategic management field (Teece, 1982, 2007; Wernerfelt, 1984; Barney, 1991; Rugman and Verbeke, 2002). The important seminal contribution in the nature and growth of a firm helped to initiate the RBV and dynamic capability streams (Augier and Teece, 2007).

Hence for Penrose (1985: 7) the core theory of growth implies the following:

'…The economic function of such a firm is assumed simply to be that of acquiring and organizing resources in order to supply goods and services to the market. It was defined therefore as a collection of human and physical resources bound together in an administrative framework, the boundaries of which are determined by the "area of administrative coordination" and "authoritative communication".'

The collection of unused resources in combination with the changing management knowledge generates a useful and unique opportunity for the firm (Penrose, 1960). This was her most prominent contribution to the field of business strategy and the study of a firm. More than two decades later, the internal firm level ideas of Penrose (1959) were cited and expanded on by Wernerfelt (1984) and popularized by Barney (1991). Subsequently, many authors (e.g., Barney, 2001a,b; Barney et al., 2001; Day and Wensley, 1988; Dierickx and Cool, 1989; Eisenhardt and Martin, 2000; Mahoney and Pandian, 1992; Nelson and Winter, 1982; Prahalad and Hamel, 1990; Priem and Butler, 2001a,b; Stalk et al., 1992; Winter, 2003; Zahra and George, 2002; Zollo and Winter, 2002) built upon and made significant contributions to the conceptual development of the resource perspective.

3.3.3 The Emergence of the Resource-Based View

Wernerfelt's 'resource-based view' of the firm was published in 1984 in the *Strategic Management Journal*. This broader resource-side position extended to exploiting existing resources and developing new ones beyond the traditional labour, capital and land presented in the past (Wernerfelt, 1984). Wernerfelt (1984)

introduced the application of formal economic tools to the broader internal resource side of a firm; it was already rigorously applied to the product side by Porter (1980). Andrews (1971) focused on the organizational competencies and resources when he examined corporate strategy. In this focus, the competitive advantage is derived from the unique or superior resources and competencies if they are matched with environmental opportunities (Andrews, 1971, Petraf, 1993; Thompson and Strictland, 1990). Wernerfelt wanted to go beyond the traditional concept of strategy as presented by Andrews (1971) in his resource position, which focused on the strengths and weaknesses of a firm. This view explored the barriers to entry from Porter's original five competitive forces based on Wernerfelt's, (1984) resource focus, which begins with the internal firm-level approach (Conner, 2002).

The challenge of looking at performance from broad, abstract resources, such as skill-sets, had not been used often in traditional economic modelling (Wernerfelt, 1984: 171). The resource perspective embraces qualities or assets that open opportunities for qualitative research beyond the traditional modelling and empirical research (Gibbert, 2006). The resource assets controlled and semi-permanently tied to the firms may be tangible or intangible, as discussed by Caves (1980), and can be analysed in terms of higher returns under varying circumstances (Wernerfelt, 1984: 172). The exploitation of these distinctive, hard to copy, and possibly costly resources controlled by a firm, as described by Wernerfelt, were the bases for the RBV framework in gaining a competitive advantage (Barney, 1997). With the framework's foundations set and the building blocks established, the RBV found great popularity and became the competitive strategy theory used over the next two decades and beyond.

3.4 Building on the RBV

In the 1990s, Barney's focus and contributions led to further interest in and popularization of the RBV. The terminologies related to the RBV were adopted by Barney (1991) and others who built on the initial works of Edith Penrose (1959) and Wernerfelt (1984) (Barney 1997). The framework for gaining and sustaining

competitive advantage was drawn from several sources. The exploitation of a firm's resource may be source of competitive advantage based on two key assumptions related to a firm's internal strengths and weaknesses. The first 'assumption of resource heterogeneity' draws from the work of Edith Penrose (1959) relating to the differentiation of the bundle of productive resources between firms; different firms have different bundles of resources (Barney, 1997: 142). The second assumption is based on 'resource immobility': resources may be 'costly to copy or inelastic in supply'; this concept was developed from the works of Ricardo (1817) and more recently of Selznick (1957: 53), who discussed the need for 'distinctive competences' with regard to Barney's (1997: 142) assumption of resources of the firm being difficult to copy or inelastic in supply (Selznick, 1957; Ricardo, 1817). These 'distinctive competencies' or 'distinctive capabilities or limitations', as cited by Selznick (1957: 52, 53), are the bases for the 'resource immobility assumption', which can be source of competitive advantage for a firm (Barney, 1991, Barney, 1997: 142). These assumptions and the persuasive explanations by Barney espousing these views helped gain increasing interest and popularity for the RBV. The traction for further research and development of a conceptual framework brought added support as well as additional challenges and critiques.

3.5 Distinction between Resources and Capabilities

The distinction between resources and capabilities has a historical context of earlier seminal work. In Penrose's work (1959), this distinction is observed in that although the resources may be available to all firms in a particular industry, the capabilities are not uniformly distributed to achieve superior performance (Oladunjoye and Onyeaso, 2007). In the RBV literature, the different terminologies of capabilities and resources have all described similar phenomena related to competitive advantage, with vague differences (Barney, 1991). RBV has been conceptualised in both 'aggregate' and 'disaggregate' levels.

According to Ethiraj and his colleagues (2005), the first, aggregate, stream includes Barney (1991) and Peteraf (1993). These scholars place resources and capabilities together so that there is no clear-cut distinction. To them, resources are 'all assets,

capabilities, organizational processes, firm attributes, information, knowledge, etc.' (Barney, 1991: 101). Conversely, the second, disaggregate, stream highlights the differences between resources and capabilities (Amit and Shoemaker, 1993; Grant, 1991). Specifically, Amit and Shoemaker (1993: 35) stated that 'resources consist... of know-how that can be traded, financial or physical assets, human capital, etc. [whereas] capabilities... refer to a firm's capacity to deploy resources', joining this latter stream. The non-tradability, or difficult to imitate capability, assumption supports Penrose's allusion to production and the importance of non-tangible and qualitative dimensions to a firm's performance. This also suggests that it is difficult for a firm to simply go out and buy expertise and expect enhanced performance. From this viewpoint, it has been argued that resources can be seen as 'inputs' into the production processes, so that without resources as inputs no production can take place (Grant, 1991: 118). In this stream, scholars (e.g., Amit and Shoemaker, 1993; Grant, 1991; Ethiraj et al., 2005; Makadok, 2001; Teece, 2009; Teece et al., 1997) support the view that the capability construct as a deployment of resources, not the view that resources themselves lead to a competitive advantage through superior performance over rivals (Oladunjoye and Onyeaso, 2007).

These debates revolving around treating knowledge as a human capital resource or as the attributes to deploy the resource have to be placed in the context of how knowledge is viewed. Knowledge has been viewed as the most important competitive asset that a firm can possess (Grant, 1996). It has been argued that knowledge, an intangible resource, is more likely to produce a competitive advantage than a tangible resource would (Hitt et al., 2001). Knowledge can be classified in various ways; one way is by differentiating articulate from tacit (Lane and Lubatkin, 1998; Polanyi, 1967). Articulate knowledge is gained from formal training and education (e.g., diploma and degree programs from colleges and universities) whereas tacit knowledge is gained from routines, social and informal learning at work (Hitt et al., 2001; Nelson and Winter, 1982; Szulanski, 1996). These important attributes and aspects of human capital resource will be discussed and developed further in chapter 4.

The disaggregated view of resources focusing on capabilities as distinct from the broad aggregate resources is also further refined in terms of the dynamic and fluid aspects of the market environment. The distinctions have been further developed in parallel to the RBV by authors (e.g., Eisenhardt and Martin, 2000; Teece et al., 1997) who have focused on the dynamic nature of capabilities with the changing environment. The original proposition of the RBV being static and neglecting the influence of market dynamism was challenged (Wang and Ahmed, 2007: 34). The dynamism of the market and the changing and evolving capabilities lead to an active environmental framework in which to view the RBV (Eisenhardt and Martin, 2000; Priem and Butler, 2001a, b). This distinction has led to the development of a parallel conceptual path that views the firm's internal and external environment, as well as capabilities, as being in a dynamic state. This perception of a need to consider the fluid nature of firms in deploying their resources within an on-going, changing environment has led some scholars (e.g., Teece et al., 1997) to contribute to the parallel dynamic capabilities stream.

3.6 The Move to Dynamic Capabilities

The dynamic capabilities perspective builds on past contributions in RBV research. The framework and concepts dealing with dynamic capabilities have been developed based on the early contributions of many scholars, such as Schumpeter (1934, 1950), Nelson and Winter (1982), Teece et al., (1997), Helfat (1997), Teece (1982) and many others. The past and present literature advances the notion of the importance of dynamic market environment and the distinction of capabilities from static resources (Wang and Ahmed, 2007: 32). This thesis has already shown that prior scholarly works have illustrated the advantages gained for a firm from static resources may not be sufficient; the firm or an organization needs to acquire, develop or change distinctive capabilities in a dynamic environment to make better use of the available resources (Penrose 1959). The original notion of fixed resources and a motionless environment in the RBV has been challenged with a turn to greater focus on the influence of market dynamism (Eisenhardt and Martin, 2000; Priem and Butler, 2001a, b). In this disaggregate view; there is a clear distinction between resources and capabilities (Amit and Shoemaker, 1993; and Grant, 1991). This

distinction, as previously presented table 2.1, along with the dynamic dimension of researching competitiveness in the RBV led to the concept of dynamic capabilities.

There are various descriptions of dynamic capabilities to explain competitiveness, depending on the perspective from which it is viewed. A dynamic capability in broader economic terms is defined as the capacity of an organization to intentionally build, broaden or modify its resource base (Barney 1991; Helfat et al., 2007). In this definition, the capabilities are viewed as resources. There is an aggregate argument for dynamic capability to be part of the resource cluster. The broader aggregate definition is applicable to both profit and non-profit organizations because both types of firms and organizations are viewed has having resources that can initiate change themselves or have change thrust upon them from a changing environment or setting (Helfat et al., 2007). The health care sector, comprising of profit and non-profit firms and entities, is a newer area of study with limited but increasing literature on the empirical test of resources and capabilities, concepts and related findings.

The aggregate view of combining capabilities with resources and the static nature as a given has been challenged. For example, Teece et al., (1997) framework analyses dynamic capability as 'the firm's process of using resources—specifically the processes to integrate, reconfigure, gain and release resources—to match and even create market change. Dynamic capabilities are thus the organizational and strategic routines by which firms achieve new resource configuration as markets, emerge collide, split, evolve and die' (Eisenhardt and Martin, 2000: 1107). The RBV is static in nature because it views resources and competencies without considering the dynamism that shapes competition (Teece, 2009).

In achieving greater competitive advantage in an ever-changing environment, the focus is on the firm's behavioural aspects in constantly improving, combining, reconfiguring, and renewing resources, which in particular includes the core capabilities (Wang and Ahmed, 2007). This behavioural component adds even more complexity to the crowded field of terms, definitions and concepts. Cognitive and behavioural components are also being added and are changing to reflect the

dynamic environment that a firm or organization finds itself competing in. In more specific disaggregated terms, which go beyond the traditional sense of competitive advantage, the dynamic capability may be dissected into the following capacities (Teece, 2009: 4):

- 'To sense and shape opportunities and threats'
- 'To seize opportunities'
- 'To maintain competitiveness through enhancing, combining, protecting and when necessary reconfiguring the business enterprise's intangible and tangible assets'

This dynamic framework analysis has been embraced by many scholars, but it also has its critics. The limitations and conceptual challenges relate to the broadness, terminology, operational usefulness and lack of direct empirical explanations. Much like the parallel stream of the RBV, dynamic capabilities and related terms have been described as being vague, non-operational, and tautological (Priem and Butler, 2001b; Williamson, 1999).

3.7 Behavioural Influence (Bromily)

The emphasis on behavioural and social phenomena has been the subject arena for the various fields, such as, psychology and sociology, as well as economics. These behavioural and social phenomena for implementing strategies have been studied in isolation of firm strategy and the competitive context (Barney and Zajac, 1994). This idea of isolation, not explicitly framing the research in a competitive context, has also been a source of challenge for some scholars trying to clarify the concepts used in the various academic fields. Barney and Zajac (1994) strongly argue that these behavioural and social phenomena must be studied in the competitive and strategy context for strategy implementation.

The challenges to Penrose (1960), Wernerfelt (1984) and Barney (1991) on the resources and firm come from different fields, not only from the economic and external industry view (Porter, 1980,1991) but also from the behavioural field

(Bromily, 2005). Since its introduction, the RBV has been developing new concepts emphasising the softer behavioural side as opposed to the hard economic side as well. The congruence of a unified view and possibly a converging theory is further challenging varied developing concepts and streams. There are difficulties in a 'coherent theoretical structure' created by the differing intellectual streams of thought on the RBV (Bromily, 2005: 89–101). The difficulties in developing a consistent theoretical framework in the RBV in the field of strategic management are further complicated by the divergence in the acceptance of equilibrium and rationality assumptions by scholars. The streams are (Levinthal, 1995):

1. *Economic Foundation Stream: Firm as a Bundle of Resources (High Church)*
2. *Behavioural Foundation Stream: Firm as a Complex System (Low Church)*

The High Church focuses on the equilibrium and rationality assumptions; whereas the Low Church is behavioural in orientation (Bromily, 2005; Levinthal, 1995). The congruence of a unified view and possibly a converging theory later on is further challenged with new concepts. This is further complicated by the divergence in the acceptance of equilibrium and rationality assumptions by scholars. If the foundations of the assumptions are different, there is an ever-present obstacle of confusion and dilution. This can be illustrated by the lack of agreement on the definition of the central concept of resources by RBV scholars (Priem and Butler, 2001a).

3.8 Limitations, Weaknesses and Theoretical Challenges of the RBV

The push for the RBV to gain support for theoretical status has stumbled because 'much resource-based research rests on partial, implicit and problematic assumptions, and that this has led to conclusions that are much less general than the proponents of the view believe' (Foss, 2000: 1). Developing a theoretical perspective requires a conceptual foundation of building blocks for generalization through on-going literature contributions. Although the contributions by scholars such as Penrose (1959), Rumelt (1984) and Wernerfelt (1984) have contributed to the theoretical development of the resource perspective, there remain limitations

and difficult conceptual challenges to be addressed (Priem and Butler, 2001). Publications in the top-tier academic journals indicate clear evidence that a substantial number of high-quality studies adopting this perspective have been published, yet 'the field can still be considered as lacking maturity' (Rugman and Verbeke, 2002: 2). A 26 year (1980 to 2005) study by Furrer, Thomas and Goussevskaia (2008) of 2125 research published articles in four leading journals (Academy of Management Review Academy of Management Journal, Administrative Science Quarterly, Strategic Management Journal, and Academy of Management Review) in the strategic management field observed an increasing interest in the RBV and corporate-level strategy and a decrease over the same time in environment and strategy as a fit in the role of top managers. Furrer et al. (2008) also listed the top cited authors in the strategic management field which include:

The top 4 authors cited from the period of 1980 to 2005 included:

1. Barney (JOM, 1991) cited 1757 times (citation per year 116.5)
2. Cohen and Levinthal (ASQ, 1990) cited 1464 times (citation per year 91.5)
3. Teece et al. (SMJ 1997) cited 774 times (citation per year 86.0)
4. Wernerfelt (SMJ, 1984) cited 1098 (citation per year 49.9)

Source: Furrer et al. 2008:13 Table4 – The most influential strategic management articles.

The validity of the RBV perspective as the framework of reference in organizational theory has been challenged on multiple grounds, such as the vague and inconsistent definitions, the link to market dynamism and the key aspect of deriving competitiveness from exploiting resources (Conner, 1991; Eisenhardt and Martin, 2000; Priem and Butler, 2001a, b; Thomas and Pollock, 1999).

Broadly, many of the criticisms and limitations of the RBV can be summarized in four categories:

1. Lack of consensus on definitions and conceptual clarity, leading to overlapping use of various concepts for the same explanations as illustrated by table 2.1

2. Equilibrium framework and static nature of the resource perspective framework vs. dynamics of the market

3. Vagueness in the nature of competitive advantage and the economic benefit/net value proposition

4. Challenges to applied theory and lack of persuasive empirical contributions

The third and fourth criticisms are important with respect to the micro-foundation development of the RBV. It is difficult to test the link between the competitive advantage and the benefit/net value proposition until there is a better understanding of how resources are embedded. The study makes an empirical contribution focusing on this critical embedding process.

3.8.1 Critical Analysis of the RBV

First, the RBV has been criticized for vagueness in concepts and definitions used and its poorly explained and tautological theoretical statements in the strategic management field (Priem and Butler, 2001a; Thomas and Pollock, 1999). The literature contains descriptions to describe or explain the same concepts using the various terminologies such as resources, capabilities, dynamic capabilities, competencies, core competencies and assets (Foss, 1997). This terminological vagueness and the lack of agreement on core definitions of key concepts continue to be a challenge when several fields of research are brought together (Rugman and Verbeke, 2002). In addition, it is difficult to generalize comparative research studies in competitiveness. Each field, such as economics, organizational science and strategic management, interpret the constructs of resource, capabilities and competencies differently (Oladunjoye and Onyeaso, 2007). This leads to differences

in the metrics and measurements as observed in the various strategic management RBV studies. The lack of agreement and multiple field perspectives on the central concept of 'resources' by scholars illustrates the difficulty of tying together a cohesive theoretical framework (Bromily, 2005: 89–101). Subsequently, this lack of clarity in the definitions and constructs adds to the challenge of developing a compelling explanation for how exactly competitive advantage is conceived.

Second, the RBV framework has been described as a static framework that struggles to explain competitiveness in a dynamic market. The RBV perspective has largely relied on neoclassical equilibrium economics to explain sustained competitive advantage but has little success in explaining it with the concepts of operationalization, developing innovation and learning (Foss, 1997). The evidence in the literature has led to a multiplicity in the RBV approach with no one clear-cut resource-based approach that embodies the contributions in a cohesive framework.

The varied depth of work from multiple approaches indicates that there is no clear conceptual explanation for the internal generation of new resources from the heterogeneous contributions of this perspective (Foss, 1997). The dynamic capabilities approach, pioneered by Teece et al., (1997), has attempted to address this weakness from another point of view. The emphasis is on the continuous changes in resource combinations and firm-level behaviours in response to the changing nature of the environment (Teece, 2009). The regeneration and the constant changing internal and external resources, skills and competencies help to explain competitiveness of a firm in a dynamic environment (Teece, 2007). The focus of this approach is described as a state of instability within a prescriptive context of a firm's pursuit of profits (Rugman and Verbeke, 2002).

Third, there is considerable vagueness derived from the lack of compelling explanation of competitive advantage. There is also a greater need for building further on the micro-foundation of the conceptual framework. The RBV has not clearly addressed issues related to it being a new theory of a firm. The firm's main goal or objective of monetary success (Conner, 1991), poorly explains its existence or scope as structure of organizing economic activity (Priem and Butler, 2001). The

fundamental assumptions of the reasons behind the existence of a firm and the concept of value attached to the transaction cost economics are some important aspects of the critical challenges posed to the RBV. Transaction cost economics dates back to Ronald Coase's (1937) seminal publication, 'The Nature of the Firm'. The choice of transaction between a firm and market (which are described as alternative modes of governance) is primarily dependent on (transaction) cost differences across alternative 'governance structures', which are driven by the degree of specialisation associated with a given 'transaction' (Williamson, 1999). The RBV perspective advocates that value, which can be a source of economic rent, can be impacted by the mechanism of governance on the exchange when the boundary of a firm is set (Barney, 1999). The increased heterogeneity in the mechanisms of governance itself can be a source of competitive advantage (Barney, 1996).

There has been overlapping contributions through the knowledge-based theoretical models (e.g., Conner and Prahalad, 1996; Miller and Shamsie, 1996) without resorting to RBV elemental arguments (Foss, 1996a, b; and Priem and Butler, 2001). It can be argued that for the resource perspective to become theoretical, it must address the concept of value more precisely; and that there must be a more meticulous formalization for 'answering the causal "how" questions, incorporating the temporal component, and integrating the RBV with demand heterogeneity models' (Priem and Butler, 2001: 15,16).

Fourth, the difficulties and limitations associated with the RBV perspective as an applied theory are evident in the lack of persuasive empirical support but abundant conceptual contributions. The RBV concepts are difficult to empirically test using the traditional definition of competitive advantage within the context of rare and valuable resources of firms. Competitive advantage has been described as superior to a financial performance that focuses on subjects of superior returns, higher quasi-rents, making money, and value creation (Winters, 1995). The RBV uses a narrower definition, best seen in terms of a gauge of the firm's potential to surpass its rival. This definition goes beyond just focusing on profitable advantage to the role of resources in value creation and how the firm outperforms its rivals in terms

of superior rents, greater profitability, increased market share, and various other desirable outcomes of interest (Peteraf and Barney, 2003). It may be argued, as articulated by Priem and Butler's (2001: 8) critique of the RBV, that this difficulty arises because the RBV does not theoretically generalize leading to difficulties in empirical testing due to tautological reasoning in the RBV as pointed out by scholars (e.g., Priem and Butler, 2001), there is a lack of law-like generalizability, which leads to difficulty in empirical testing (Bacharach, 1989; Hunt, 1991). This indicates that further conceptual work is needed to elevate the resource perspective to a theory.

This argument is challenged by Barney (2001), who argues that it is possible to derive empirically testable assertions from the RBV model and that components of this RBV are parameterized in ways that can be tested empirically (e.g., Barnett, Greve, and Park, 1994; Brush and Artz, 1999; Poppo and Zenger, 1998; Makadok, 1998, 1999; Miller and Shamsie, 1996; etc.). The focus of this defence is in the way that Priem and Butler (2001) restate parts of the RBV argument to make it tautological, which can easily be applied to parts of other theories to render them tautological (Barney, 2001).

It can be further argued that the broadness and conceptual vagueness of 'any applied potential theory, such as the RBV, lacks an unlimited number of levels of analysis, for each shift in level takes the analysis farther from the empirical level and thus from any practical implications' (Kraaijenbrink et al., 2010: 352). The practicality issues are reflected in the challenges of choosing a level and unit of analysis for empirical research. The explanation of how competitive advantage is gained using the resource unit of analysis faces limitations when it is viewed with the surrounding environment and impact of other resources. This analysis, without considering the possible impact of surrounding resources and the environment, has been noted as having limited empirical persuasion. The challenges revolve around explaining competitive advantage either through individual resources, as illustrated by Peteraf (1993), or through clusters of resources, as supported by Dierickx and Cool's (1989) framework, with interplay and dependence among them (Foss, 1997). The interdependence and related influences of resources may give a more complex

explanation of competitiveness. Along with the cluster perspective, the competitive advantage of a firm may reflect the market position (Dierickx and Cool, 1989; Wernerfelt, 1884).

3.8.2 Gaps in the Literature and Contribution Remarks

The shortcomings and limitations of the RBV are similar to any relatively new, developing perspective, with on-going contributions. Challenges to generalizing the conceptual framework must answer the many questions that remain, and 'the core concept requires clarification and development of the conceptual underpinnings along with grounding in empirical observation' (Helfat et al, 2007: 1). The study examines the empirical challenges related to methodology, metrics and measurements in the empirical testing of the RBV micro-foundational concepts.

Having reviewed the development of the RBV perspective within the management literature, it is now possible to consider the contribution which this thesis seeks to make. Thus far, the review has shown that the language used for the unit of analysis in the human capital resource literatures does do not itself easily to conceptual or empirical clarity. Further, little thought has yet been given to the practicalities of embedding new human capital resources, competencies and operational capabilities in the firm. This is a key oversight in the literature and will form the primary focus of the research presented in this thesis. The limited direct empirical RBV research is seen as problematic to the point where key figures in the debate suggest that the RBV has reached a crossroads (Barney, 2011). Hence, this thesis seeks to make a specific mid-level, theoretical and empirical contribution to the RBV by investigating the practicalities of imbedding new intangible (soft) human capital resources, competencies or capabilities in an organization. The importance of intangible assets, resources competencies or capabilities as a part of other research on competitive advantage since the 1980s and 1990s has been presented by scholars working in parallel track to the RBV. The term intangible assets have been linked to the term invisible assets. The invisible assets such as skills, customer trust and loyalty, corporate culture, innovation and technology are central to gaining a competitive advantage but they are difficult to develop or acquire

requiring a great investment in time (Itami, 1987). Other researchers (e.g., Prahalad and Bettis, 1986; Prahalad and Hamel, 1990, and Teece, 1980), have focused on the less tangible assets shared across firm's units, developing real value through diversification based on the competence-based theories of corporate diversification. These intangible assets were considered the firm's cognitive dominant logic that was much more difficult to develop, acquire or imitate Prahalad and Bettis (1986). This research direction viewed collective learning in a firm as a component of the firm's core competency (Prahalad and Bettis, 1986; Barney and Clark, 2007).

This thesis will aim to develop a micro-foundation for the RBV by investigating the effectiveness of mechanisms by which new resources are embedded in the firm. Specifically, the mechanism of embedding in the RBV is explored empirically at an individual level of analysis.

3.8.3 The Terminologies and Other Perspectives

The related literatures on behavioural aspects of the RBV and core competencies have similar limitations due to lack of clear definitions, terminologies and empirical support. Much like the RBV gaps discussed above, the area of dynamic capabilities and behavioural streams as it applies to acquisition, development, deployment, and management of these resource bundles, is bound by similar parameters. Within these weaknesses and limitations, there are opportunities to build on the conceptual framework through empirical support. In order to develop an executable research design, this research focuses on self-reported competence in relation to specified managerial tasks. This allows the somewhat vague concept of human capital resources within the firm to be assessed from the perspective of organization members. This will enable the research to develop a mid range theoretical contribution about resource embedding. Self-reported responses of confidence and competency on the part of clinician mangers, may ultimately affect performance but a necessary first step in moving the field forward is to establish some clarity over the ways in which resource embedding occurs.

It is difficult to differentiate among resources, competencies and capabilities (Barney, 1991), but it is possible to clearly develop units of analysis and measurements for intangible human capital resources. This dissertation research does not claim to show direct differences among clear, tangible units of analysis in clear positivist terms. It illustrates and lays out a methodological framework for developing and measuring units of analysis for intangible human capital resources. These performance differences as indicated by self-reported competency rankings lead to value creation or net benefit, which give a firm or an organization a competitive advantage. The assertion is that the observed difference in competency through self-reporting may empirically be used to explain the competitive advantage that gives rise to differences in managerial performance. The differences in self-reported competence indicate value creation or net benefit at an individual level for the firm based on the efficiency theoretical model.

3.9 Competence in Human Capital Resource Development

Depending on the level of focus, human resources can be analysed in several ways—either at a macro unit of analysis that 'focuses on organization variables', or at the micro level, 'focusing on individuals or small work groups with shared identity' (Wright and Boswell, 2002: 6,7). These macro- and micro-level streams of analysis have been studied in multiple perspectives and disciplines, including strategic management, economics, sociology and psychology. With an ever-growing emphasis on training and education, there is recognition of the need to align the macro-level with the micro level analyses in the resource-based view (competence) and human resource management literature (Lindgren et al., 2004). Doing so embraces the focus on competence at an individual level as an indicator of human capital resource development through training. In this micro-level analysis, our research examines competence at an individual level. The emphasis is on broad flexible competence or 'firm-specific competences that are not connected to single tasks, but can be activated in solving a large number of different tasks' (Nordhaug, 1998: 8). This objective is accomplished through an analyses of the impact various types of multidisciplinary training (e.g., management) on competence, which is self-reported in a large number of tasks.

Historically, the importance of competence has been linked to human resource development with respect to training since the later part of the 1980s (Meriot, 2005). In much of the RBV and related literature stream, competence has been analysed and discussed at a macro-organization or firm level by scholars such as Barney (1991) and Prahalad and Hamel (1990). This is also evident in the dynamic capability stream of viewing organizational capabilities at a macro level (Teece et al., 1997) as opposed to the operational capabilities, which are observed in an individual micro-level analysis. In contrast and along a parallel stream to the macro-level investigation, our dissertation examines the micro-level analysis of a competence framework for human capital to explain competitiveness from the resource-based perspective. This micro-level analyses 'consider the competence concept an individual-level concept' (Chen and Chang, 2010: 678). In explaining individual level competence, a classification framework defines specific human resources for 'work related competence' of individuals as 'the composite of human knowledge, skills, and aptitudes that can serve productive purposes in firms' (Nordhaug, 1994: 8).

3.9.1 Competence and Dynamic Strategic Flexibility

In human resource development, the case for multidisciplinary training and education for broadening competence in non-specific competencies (e.g., clinical) for medical professionals is important in a dynamic environment with changing expectations. This attention is paramount if the focus is to be shifted from needs for static fit competence to needs for dynamic competence adjustment. In this respect, the competitiveness is derived from the development of dynamic strategic flexibility through the changes in components of skills and knowledge in a firm (Hitt et al., 1998).

The development of either dynamic strategic flexibility or static strategic flexibility can be observed through the choices made in developing human resource. The creation of dynamic strategic flexibility is partly brought about by developing human capital as opposed to static flexibility which is created in part from outsourcing and using contingency labour (Hitt et al., 1998). An extension of this

perspective for our study emphasizes the importance of dynamic strategic flexibility through developing human capital, by giving medical professionals (e.g., physicians) management training. Static flexibility would be created instead if the healthcare firm outsourced for management and administrator labour.

3.9.2 Self-Reported Competency

In evaluation of competence development, individuals or groups are appraised either through perceptions of others or through self-reporting. In many of the past studies and current appraisals, this was done through the 360-degree or multiple-rater system (Bailey and Fletcher, 2002; Cheung, 1999; Mabey, 2001, McDowall and Mabey, 2008; Yammarino and Atwater, 1997). The concept of multiple raters was derived to obtain multiple ratings and perceptions from several sources or people (e.g., supervisor, manager, co-worker or external observer). There are alignment and calibration challenges and limitations to this method because of the different human perceptions to the scales and observations. Human perceptions, being intangible and a soft measurement can vary from individual to individual. To better understand the concept of competence and how it is understood by the human source; the self-reported method may be another useful tool for data collection. It can be an important tool to obtain another angle or the direct perception of the individual in the firm to gauge the human capital resource development.

It is possible to study management training and educational tasks through more than one discipline. This supports the premise that 'taking into account the increased demands for flexibility and readiness for change facing most contemporary organizations, we need to devote additional attention to non-task-specific competences and their significance for efficiency, competitiveness, and career mobility' (Nordhaug, 1994: 8). In this study, the initial micro-level analysis of competence in human resource development is examined against the macro-organizational or firm-level development. Consequently, we examine the broader individual-level competence that is reflected (by self-report) in carrying out multiple management, leadership and administrative tasks beyond the expected clinical duties of medical professionals.

In the broader examination of the individual-level competence and competitive advantage, it is helpful to broaden the level of analysis in the competitive and strategic management literature. The importance of competitive advantage in the field of strategic management is explored in the next chapter. This much wider focus puts the concept of competitive strategy of the RBV literature in perspective with the wider multidisciplinary focus in the various schools of strategic management.

3.9.2 Conceptualizing Confidence and the Competency in the RBV Literature

Section 3.9 was a discussion of the importance of competency development in the RBV literature. In the RBV, the terminology of competency can be viewed in disaggregated terms, such as the focus on core competency (Prahalad and Hamel, 1990) and in aggregated terms for practical reasons as a concept similar to resource or capability (Barney, 1996). Confidence is another attribute of human capital development that can be linked to competency. Unlike the term competence, confidence is not explicitly singled out in the RBV literature. It is, however, an attribute of human capital.

This section highlights the link of confidence with competency as an attribute of the human capital resource. The self-ratings of confidence and the future level of competence have been a source of discussion and research in numerous scholarly health care literatures (e.g., Clark et al., 2004; Valdez et al., 2006; Williams et al., 1997; Wu et al.,, 2007). The link between confidence and competence in the context of management training, education and development of medical professionals is one of the broader themes of human capital development.

Competency is defined by Oxford Advanced Learner's Dictionary Online (2011) as the ability to do something (such as a task), whereas confidence is defined as a belief in others, belief in oneself, feeling of certainty, or feeling of trust. The focus of this research in terms of the definition of confidence relates to the belief in one’s own ability to do a task successfully. Although, the primary focus of this dissertation is on competency as an attribute of human resource as it applies to the

RBV literature, a secondary focus is on the concept of confidence. The Merriam-Webster Online Dictionary (2012) defines competency as a conscious level of one's power faith or belief that one will act in a correct or effective manner. In this definition, there is also a focus on the psychological component of trust and feeling. In the study, confidence is measured with respect to competency to gather another attribute of human capital that focuses on self-reported cognitive perception of medical professionals. The study also explores in comparison the self-reported ratings of confidence and competency.

In the learning and skills development research literature, confidence and competence have been a source of discussion which have been studied by a number of scholars (e.g., Arnone et al., 2010; Elzubeir and Rizk, 2001; Ulrich et al., 2010; Wagner et al., 2009). Other research and scholarly papers on entrepreneurship (e.g., Box et al., 1993; Brush and Hisrich, 1991; Inmyxai and Takahashi, 2010; Robichaud et al., 2010; Yusuf, 1995) have suggested that education in general and the length of formal education prior to starting a business can enhance confidence, knowledge, and skills, positively influencing a firm's success. Competencies that focus on a drive for learning and trustworthiness have been linked to the confidence attribute (Yuksel, 2011).

The cognitive perception of confidence and competency has been debated from a motivational and psychological perspective in the context of the self-determination theory (e.g., Kowal and Fortier, 1999; Markland et al., 2005). Self-determination theory (SDT) is a macro theory of autonomous self-motivation related to behaviour change and personality development (Deci and Ryan, 1985; Gagne and Forest, 2008; Ryan, 1995). The central principle of SDT theory is that people have an inherent organizational tendency toward cognitive and social development and psychological needs (Ryan and Deci, 2000, 2008). SDT indicates a possible link between confidence, or an expectation of future competence, and its importance to intrinsic motivation (Dingle and Kiewa, 2006). From this perspective, one can certainly study the intricate psychological or social links from a cognitive component stream, but the present thesis focuses primarily on the measurements of these linked attributes

of confidence and competency as they relate to the RBV literature in the development of human capital as a resource.

The present research examines the self-reported confidence and competency with respect to different types of management education and training. Specifically, the dissertation examines the self ratings of medical professionals on their confidence and competency with respect to four groups clinical and four group's management tasks encountered in a healthcare firm. Because the RBV considers the terminology of competency or core competency in relationship to resource development, the study further examines competency with an added numerical management task (finance).

The knowledge intensive research setting in which the medical professionals operate in is discussed and explored in the next chapter. Chapter 4 is an overview of the setting of the study in the Canadian healthcare system. It explores the history and current environment of the federal, provincial and private influence. Further it investigates the drive for competitiveness in a largely publicly funded but privately administered fee for service model.

Chapter 4

Research Setting

4.1 Introduction

The purpose of this chapter is to discuss the environment and context of the knowledge-intensive health care industry in which the confidence and competency in human capital resource development is examined. The broader aim and focus of the research, as previously stated in chapter 1 (section 1.2 and sub-sections of 1.5.1), is on competitive strategy in human capital development, which is linked to gaining competitive advantage for a firm. The chapter begins with the exploration of the past and present Canadian health care system and the nature of competitiveness in this environment. The chapter provides the background and context of the current Canadian health care policies through the fusion of federal-provincial/territorial initiatives and then gives an overview of some the intertwined current competitive issues. The chapter focuses on the competitiveness at an internal individual firm level in a highly knowledge intensive health care and medical setting, also investigating the approach of multidisciplinary training and multi-tasking in the health care medical sector. Finally, the chapter outlines the relationship of the human capital development as advocated in the RBV and the very rigorous knowledge-focused Canadian health care setting for this study.

4.2 Knowledge-Intensive Healthcare Environment

The study of medical professionals set in the very knowledge-intensive environment of the health care sector is ideal for examining management training and its impact on confidence and competency. The self-reported ratings are used as an indicator of the embedding of human capital resource as discussed initially in chapter 1, sections 1.3.1 The knowledge-intensive environment for the medical professionals is highlighted by the push for evidence-based medicine, constant academic research on treatments and cures, and collaborative training and education (AAMC/HHMI Expert Committee Report, 2009; Arya, 2007; Frank, 2005; Romanow, 2002; Rodwell and Teo, 2004). The study also examines the management training through the self-

reported competency and confidence of the learning and knowledge attributes of the human capital resource as discussed in sections 1.4 and 1.6. The links to cost, quality and performance are explored in the literature. The importance of an environment that fosters learning, knowledge and academic research to costs, quality of care and performance has been explored by scholars (e.g., Bontis, and Serenko, 2009; Cox et al., 2011; Doyle et al., 2010; Khatri et al., 2009).

4.2.1 Knowledge Intensive Firm

The term knowledge-intensive has been used to highlight the importance of knowledge as the central focus (Starbuck, 1992). Knowledge-intensive firms have been described as possessing a well-educated and qualified workforce engaged in intellectually challenging work (Alvesson, 1993, 1995, 2000; Nurmi, 1999; Starbuck, 1992). The knowledge-intensive firms gain a competitive advantage from the human (embedded individual tacit and explicit knowledge) and social (embedded knowledge in routines and relationships) capital (Alvesson, 2001; Nelson and Winter, 1982; Starbuck, 1992; Wright et al., 1994). The theoretical focus of the study is on examining the strategy of development of human capital resource, as advocated by the RBV, in gaining a competitive advantage.

4.2.2 Resource Embedding in the Canadian Healthcare Sector

The healthcare sector is an ideal place to investigate human capital resource embedding. The central players, medical professionals (Physicians), represent a source of valuable human capital resource where the development of skills through training in a knowledge intensive environment can be studied at an individual level. The Canadian medical health care sector was chosen for the study for two main reasons. First, in this ever-changing and dynamic environment, a compelling explanation of competitiveness in the Canadian health care field has remained a challenge with cost containment, quality improvement and changing role expectations on clinical and management tasks. Although the majority of the funding of the Canadian Healthcare system is derived from the federal/provincial partnership, the hospitals, private practices and institutions are administered and

run privately. The competition arises between the provinces, hospitals, and other healthcare institutions and practices for resources, cost containment and quality. There are challenges and opportunities to contribute, as discussed in sections 2.8.1 and 3.6.2, in explaining competitiveness and strategy through lenses of different fields (e.g., healthcare, psychology, strategic management and economics) in the RBV literature. Second, the Canadian health care sector is a highly knowledge-intensive arena, ideal for studying the impact of management education for physicians on clinical and management tasks. The development of evidence-based medicine at McMaster University in Canada, which is considered by the prestigious *British Medical Journal* one of the 15 greatest breakthroughs since 1840, is one example of this knowledge-intensive environment in the health care and medical field (Arya, 2007).

Canada is a vast country consisting of 10 provinces and three northern territories with a population of approximately 34 million people. The Canadian Medicare system was founded on five basic principles: universality, portability, accessibility, comprehensiveness and public administration (Lewis et al., 2001). Since 1867, although constitutionally the primary responsibilities are given to the provinces, the health care policies have emerged from a complex set of federal–provincial relationships (Deber, 2003). The drive forward for a nationally competitive strategy has been evolving since the establishment of the first provincial hospital insurance program in Saskatchewan. The first universal health care plan in North America was inaugurated by the provincial leader, Tommy Douglas in 1962 (Taylor, 1992). By the mid-1960s the adoption of this provincially administered universal medical insurance plan by the rest of the nation gained traction as the federal government offered a 50/50 cost sharing arrangement (Irvine et al 2002; Marchildon, 2009).

Canadian health care policy is subject to a balancing act between national uniformity and standardization driven by federally funded transfer payments and regional pluralism resulting from provincial administrative independence as entrenched in the 1867 constitution (Naylor, 1999). By 1971, central government provided 50 percent cash payments to all 10 provinces (Alberta, British Columbia, Manitoba, New Brunswick, Newfoundland, Nova Scotia, Ontario, Prince Edward

Island, Quebec and Saskatchewan), which had agreed to administer and partially fund universal hospitals and medical insurance programs that conformed to the core requirements established by the federal government (Iglehart, 2000). The present Canadian healthcare is funded approximately 70 percent by the federal/provincial governments and 30 percent privately (Barenak et al., 2010). The present 70 percent of the funding through the federal/provincial agreement is based on a more flexible customized cash and tax transfer system replacing the 50 percent cash payment. The more flexible federal government funding is through the Canada Health Transfer in which the value of the tax point (transfer) to the provinces increases with the economic activity, while the cash transfer is legislated through a federal provincial fiscal arrangement act agreement (Gauthier, 2011).

Although the federal government discourages extra user fees and billing, physicians are legally free to opt out of the public plan in each of the provinces (Flood and Archibald, 2001). Since, as discussed before, that each provincial government administers healthcare for the province. There is no fee cap for opted out physicians in most provinces except three (Manitoba, Ontario and Nova Scotia) in which there is a price cap coordinated with the public allowable fee payment (Flood and Archibald, 2001). The essential medical and hospital services are largely covered by the federal/provincial agreement while all other services (e.g., patient prescription drugs, dental treatment, cosmetic procedures, home care, long-term care, medical aids and appliances, etc.) are a subject to a mixture of public and private insurance finance that vary across provinces (Tuohy et al., 2004, Schoen et al., 2010).

In the decades following the 1960s, Canadians have renewed and attempted to redefine their commitment to national health care through numerous federal and provincial government-sponsored reports (for example, Report of the Premier's Advisory Council on Health (Mazankowski, 2001); Canada – National Forum on Health, (1997); Commission in the Future of Health Care in Canada, (Romanow, 2002); Health and Welfare Canada, The Lalonde Report, (Lalonde 1974); The Ontario Health Services Restructuring Commission, 1996-2000 (Sinclair, 2000). These and many other reports on the state of the healthcare system, sustainability

and cost management have created an impetuous to explore competitive strategies between the provinces and the privately administered hospitals and practices. The examination and reviews from these commissions and reports create opportunities to examine the healthcare environment and the firms from both an external and internal perspective as discussed in prior sections, chapter1 and 3, sections 1.1 and 3.1. The competitiveness between provinces, territories, private and public health healthcare facilities, opted in and opted out (public insurance) physicians is important because there are limited resources, pressures to contain cost, develop human capital and improve quality of care (Flood and Archibald, 2001; Romanow, 2002).

The explanation of attaining competitive advantage in terms of heterogeneity, as previously discussed in chapter 1 (section 1.1 and 1.5), advocates that superior economic value is derived from distinctive and superior competence or resource (Collis, 1991). In this dynamic Canadian health care system, the different levels of net cost and quality benefits arise from differing resource bundles across firms that dictate the level of efficiency (Peteraf, 1993). The study takes a general aggregated view of value to encompass a wide variety of outcomes derived from embedding training and education in human capital. If clinicians' human capital is enhanced through the embedding of multi-disciplinary (management) training and education, then there may be a beneficial impact on the quality of care, cost reduction, effectiveness and efficiency through better collaboration and teamwork. As previously discussed in chapter 3, sections 3.2 and 3.3.2, the study applies the RBV internal firm perspective (e.g., Barney, 1997; Wernerfelt, 1984) rather than the market-based external approach (e.g., Porter and Teisberg, 2006).

4.3 Resource-Based View verses Knowledge-Based View Focus of the Firms

The literature on the concept of knowledge can be diverse and interrelated, incorporating various disciplines such as psychology, sociology, management and economics. There are differing levels of focus that can be taken by scholars, depending on the research aims (Barney, 1991; Bernecker and Dretske, 2000; Grant, 1996; Peteraf, 1993; Pritchard, 2006; Lemos, 2007; Sveiby, 2001). As previously

argued in section 2.11, each resource concept in an internal view of the firm, such as knowledge, skills and abilities, can be viewed at a macro or micro level and from differing disciplinary perspectives (Garbuio et al., 2011; Prahalad and Hamal, 1990). The multiple approaches and views open up opportunities for finer distinctions understanding of competitiveness because of the introduction of the concepts such as knowledge but also create challenges to the theoretical coherence and unification of the subject as Priem and Butler alluded to in their critique of the RBV as discussed in Chapter2, section 2.8.1.

The RBV of the firm as previously introduced in chapter 1 (section 1.1 and 1.3) advocates that a firm achieves competitive advantage through the application of the bundles of resources it possesses (Barney, 1991; Barney and Clarke, 2007; Grant, 1996; Peteraf, 1993; Rumelt, 1984; Wernerfelt, 1984). In the RBV, the main objective of management is to maximize value through the best possible deployment of existing resources and the development of future resources (Grant, 1996). The sustained competitive advantage for a firm is achieved through superior returns, as previously discussed in sections 1.5 and 1.8. The RBV approach includes knowledge as an important attribute of the human resource bundle, contributing to an increased competitive advantage for a firm (Barney, 1991, 1997).

The broader knowledge-based view of the firm emerged from different disciplines such as economics, sociology and philosophy (Kaplan et al., 2001). The diversity of contributions from these disciplines poses challenges to a coherent and unified position of the knowledge-based view of theoretical development (Foss, 1996a). The knowledge-based view advocates that a theory of the firm should be centrally based on considerations of knowledge, rather than focusing on the concepts and links of incentives, opportunism, and transaction costs for a firm (Foss and Klein, 2005). In the knowledge-based view, the distinct productive knowledge bundles are tied to the differential efficiencies, as discussed in section 1.3, which are a source of competitive advantage for a firm (Foss, 1996). Although knowledge considerations are central to this approach, the knowledge-based view of the firm faces challenges similar to those faced by the RBV because of the vague and multiple disciplinary approaches (Kaplan et al., 2001). Although there are various

approaches, the knowledge-based views of the firm can be perceived as an outgrowth of the RBV in that it views knowledge as the most important strategic resource (Grant 1996).

It is possible to take a disaggregated approach in examining how competitive advantage is achieved for a firm. In this context, the multitude of investigations and challenges (e.g., Foss, 1996a; Kaplan et al., 2001; Priem and Butler, 2001) are acknowledged along with the various developing views. The study takes an aggregated approach to knowledge and development of human capital. In a macro-level analysis, core competencies are linked to organizational learning and are knowledge based (Prahalad and Hamel, 1990). These competencies are linked to the embedding of resources that lead to the growth of a firm (Peteraf, 1993). It is in this broader view that the study examines the self-reported competencies linked to the knowledge-based view for human capital development.

4.4 Knowledge Attribute in Human Capital Resources

The study of the theory of knowledge or epistemology is a one of the core areas of philosophy. Many types of knowledge are relevant to the firm (Grant, 1996a). There are various types and classifications of knowledge. These are studied from a variety of perspectives that contribute to various theories in numerous fields. An early Greek philosopher, Plato, advocated a traditional, propositional definition of knowledge as a justified true belief (Kakabadse et al., 2003; Lemos, 2007). Knowledge can be divided along many fine distinct dimensions. Some examples of these divisions are objective versus subjective, procedural versus declarative and explicit versus implicit (tacit) (Grant, 1996a). In the explicit versus tacit dimension, knowledge can be described as explicit (knowing about), which is captured, codified and communicated; or as tacit (know how), which is subjective, resides individually, is difficult to put into words, and is seen by action (Ambrosini, and Bowman 2001; Polanyi, 1958, 1966). The study explores the effect of management training as measured by the confidence and competency self-ratings as discussed in chapter 1, sections 1.3.1 and 1.5. The formal education and training programs at universities are perceived to disseminate explicit knowledge that is brought into the

firm and develop tacit knowledge through the experience of doing the tasks (Hitt et al., 2001). The individual cognitive-level analysis of self-reported data on confidence and competence in clinical and management tasks in the study represents a focus on the subjective, declarative and tacit form of knowledge through management training. The firm-specific tacit knowledge is more difficult to imitate, making it a better source of competitive advantage for a firm (Barney, 2001).

Knowledge is manifest at various ontological levels: the individual (arguably reflected to some degree by human capital); at a group; shared, or at network levels (arguably, social capital); or at an entity or firm processes and databases level (organizational capital) (Hitt et al., 2001). There is an extensive literature on knowledge and knowledge-based theory of a firm (e.g., Bernecker and Dretske, 2000; Grant, 1996a, b; Lemos, 2007; Pritchard, 2006; Sveiby, 2001). As discussed in chapter 1, section 1.0, training, education, skills, knowledge, insights, abilities, relationships, and intelligence of individual managers and workers are attributes of a human capital resource as advocated by the RBV (Barney, 1997; Becker, 1964; Hitt and Ireland, 2002).

The conversion of learning and knowledge acquisition from an individual level to an organizational level has been studied by scholars (e.g., Dutrénit, 2000). The study does not set out to explain the translation of the individual-level learning to organizational learning. As previously stated in chapter 3, section 3.5, the study leans toward an aggregate view of competence, resources and capabilities at the individual level of human capital resource development. The resulting aggregate of individual-level, self-reported responses of confidence and competence in the developing human capital do not prove that there is a direct translation of individual-level learning or knowledge acquisition to an organizational level learning or knowledge acquisition. The relationship and the link of individual and organizational or group level analysis require further study by scholars.

Epistemologically, the study takes a constructivist view on knowledge. This is discussed in detail in chapter 5 (section 5.6). The present study acknowledges that

there are many detailed philosophical approaches, views and firm applications of knowledge (e.g., Conner, 1991; Grant, 1995; Polanyi, 1967; March, 1991; Nonaka, 1994; Nelson and Winter, 1982; and Spender, 1996) and philosophically focuses on the tacit knowledge attained by training and education. The study does not focus on the detailed intricacies and complexities involved with the concept of knowledge development and deployment but rather explore the less tangible resource attribute of knowledge and the embedding of training and education into the human resource bundle. Specifically, in the conceptual RBV context, the present dissertation explores the development of knowledge attributes in the human capital resource of key individuals through management training. The embedding process through training and education makes available the developed human capital resource to the firm (e.g., Barney, 1996, 2011).

4.5 Knowledge and Competitive Advantage

The need for a competitive strategy in the light of derive for more efficiency in the healthcare system as advocated by government commission papers (e.g., Governance and management of change in Canada's health system (Denis, 2002)) and Commission on the Future of Healthcare in Canada (Romanow, 2002) has led to a greater focus on the technology and knowledge management to decrease cost and increase the quality of care (Bose, 2003; Heathfield and Louw, 1999; Matheson, 1995). Knowledge has been a bridge between the Strategy and Human Resource Management literature (Barney et al., 2001). It has been viewed as a vital resource that provides a competitive advantage for a firm (e.g., Foss and Pedersen, 2002; Grant, 1996; Matusik, and Hill, 1998; Murmann, 2004; Spender and Grant, 1996) and development, motivation and retention of workers (Wright et al., 2001). More specifically, there is also considerable literature linking tacit knowledge and competitive advantage. The literature on tacit knowledge as a valuable intangible resource, which is a source of competitive advantage for a firm, has been explored and investigated by a number of scholars (e.g., Barney, 1991; Berman, Down and Hill, 2002; Grant, 1996; Kogut and Zander, 1993; Lippman and Rumelt, 1982; Nelson and Winter, 1982; Reed DeFillippi, 1990; Teece, 1982; Teece and Pisano, 1998). Although knowledge-based theories investigate the various types, relationships and

social aspects linked to competition, the study, as outlined in sections 1.2 and 2.5, focuses on the individual human capital development with knowledge, skills, and capabilities being an important part of this valuable resource.

4.6 Physicians' Dual Roles and Responsibilities (Clinical and Management)

Ideally, physicians strive for professional autonomy to make choices in practice and maintain loyalty to their patients for their care and well-being. The limited resources, government funding, professional regulations, administrative costs, diverse insurance plans and fiscal realities can have an impact on the physician's role and responsibilities (Casalino et al., 2009; Hillman, 1991; Butcher, 1998; Shortell et al., 1998). Medical professionals can face dual roles in the clinical and management setting within the health care sector; dual roles require multiple skill-sets. This is highlighted in the health care culture by the difficulty of the dual role and responsibility of physicians in the best interest of their patients while managing costs within the health care system (Butcher, 1998). The involvement of a physician with management leadership, governance and board roles has been linked to better quality management, strategic quality planning, hospital production process and communication between clinicians and management (Weiner et al., 1996). The first role, clinical, is explicit in championing the interest of the patient as stated in the Hippocratic Oath (Markel, 2004). The second role is not an explicit duty and not usually formally recognized in Canada, which is the management role and financial duty to protect taxpayers from high cost (Butcher, 1998). Medical professionals operate under limits and constraints in resources and budget while working in the best interest of the patients. This has been described as a 'double-agent role', in which the physician is required to serve the interest of the patients being treated and the firm or organization she works for (Shortell et al, 1998: 1102).

The debate on health care financing, quality and education brings closer scrutiny and focus on the physicians and their motivation (Jane and Cassel, 2010). It requires transparency and close cooperation of all parties in the health care arena. The design and implementation of a quality, cost-effective, value-driven health care delivery system that provides quality patient-centred care requires the

direct efforts of all stakeholders, including patients and medical professionals (Dove et al., 2009). Physicians are always obligated to provide their patients with the safest, most effective and best care possible while also keeping their obligation to taxpayers and society at large as trusted guardians of health care resources (Brett and McCullough 1986; Silversmith, 2012). These dual responsibilities of physicians present an opportunity for them to take leadership roles in a clinical and management setting to reduce cost by communicating safe, effective, lower-cost treatment options that work just as safely and effectively as much more expensive comparable options (Dove et al., 2009; Fisher et al., 2009).

4.7 Medical School, Management Training and Multi-tasking for Medical Professionals (Physicians)

The integrated delivery system, which combines clinical and administrative functions, an increasing role for physician executives and leaders, and greater influence in the health care system have all led to increasing advocacy of management training and education for physicians in Canada (Moor et al., 2005). There is limited empirical strategic management literature in this area, but in the health care field there has been a call for a more in-depth investigation to find ways to improve the health care training and education for physician executives and leaders. Several prominent health care facilities such as the Mayo Clinic and Cleveland Clinic have introduced and offered internal physician leadership training programs (Scott et al., 1997; Stoller et al., 2007). Others (e.g., Chandler and Forman, 2003; Sherill, 2000; Larson et al., 2003) have explored external dual medical and management (MD/MBA) degree programs pointing to the advantages of earlier training that helps develop physician executives and leaders. Some professionals and scholars have advocated applying management science principles to health care tasks such as patient safety, improvement in quality of care, decision making, organizational activities and effectiveness (Larson et al., 2003). There is limited literature on this subject, but with greater emphasis on physician manager, executive, and leadership roles and multidisciplinary collaboration in the future, there is a greater exploration on this subject (AAMC/HHMI Expert Committee Report, 2009; Frank, 2005; Romanow, 2002).

The study explores the importance of changing or enhancing training and education for multi-tasking (clinical and management), which is vital to overcoming competitive and value-based challenges. These value-creation and efficiency-based approaches discussed earlier in chapter 1 (sections 1.3.1, 1.5) remain a constant source of debate for the human capital resource development study (e.g., Amihud and Lev, 1981; Barney, 1997; Becker, 1964; Collis, 1991; Foss and Knudsen, 2003; Lang, 1994; Rigdon 1993; Weiss, 1983). The need to think outside the box and incorporate a multidisciplinary approach (e.g., management training) is the drive for the present study research. The lack of management- and business-related training has been illuminated for the medical professionals as expected; medical students are focused on learning how to be good doctors, not confident and knowledgeable managers. This leads to the conclusion that many physicians are relatively poor at management tasks (Saver, 2008).

Overall, there is literature on medical management training and dual roles for doctors but limited dedicated empirical research on the model (Dwyer, 2010). In the present study, the multi-tasking in the health care field is divided into clinical and management tasks. The tasks related to the clinical side of health care are normally taught in medical training. In this respect, for the dissertation research, it would be expected that a lengthy medical school, internship, and residency training in medicine and clinical tasks could serve as a control for competency and confidence for self-reported ratings on clinical tasks. The average medical school clinical and medical training is four years, with one year of internship, followed by about four years or more of residency and specialization, which leads to graduation and completion for many in their mid-thirties (Deitz, 1990). In Canada, all applicants to medical school must have three years minimum of undergraduate university education to apply to a four-year undergraduate medical school program (University of Toronto; Faculty of Medicine, 2012). The medical school and hospital residency training can take anywhere from 9 to 12 years or longer before the student can become specialized as a family practice physician or in other areas of medicine (British Columbia Medical Association, 2007).

In the study, a specific set of management tasks are identified for which there is little, to no, management training during medical school (Dwyer, 2010; Lazarus, 2009; and Saver, 2008). Self-report confidence and competency are compared between these managerial tasks and a set of clinical task for which there is very lengthy, a minimum of 5 to 10 years, medical and clinical training. With the numerous calls for strategic drive for transformation and changes to multidisciplinary education, including management training for medical professionals (e.g., AAMC/HHMI Expert committee report, 2009; Romanow, 2002) and along with the highlighting of benefits management training for medical professionals (Dwyer, 2010; Lazarus, 2009), there is an important opportunity for empirical mid-level theoretical research supporting the limited literature in the area. The study's aim (see section 1.13), was to empirically investigate the sparsely studied micro-level analysis of the RBV concepts of competency and human capital (Barney et al., 2011). The micro-level analysis of competency and confidence of the medical professionals is not fully understood in relationship to increasing pressure for dual responsibilities of clinical and management tasks as explained in section 4.6.

4.8 Physicians' Competency and Management Tasks

The need for greater accountability in all facets of the medical profession has guided medical educators to focus on the competencies that affect the outcomes and influence the end results (Frank and Danoff, 2007). The Royal College of Physicians and Surgeons of Canada (RCPSC) (2005) in their publication, 'The CanMEDS 2005 Physician Competency Framework', listed the physician's role as a medical expert, communicator, scholar, health advocate, professional, collaborator, and manager (Frank, 2005). The inclusion and highlighting of competencies as a manager for a physician in the framework parallels the investigative focus of the study. The physician's role as manager is vital to the participation and effectiveness of the health care firm and system, organization of a sustainable practice, decisions making, and resources allocation (Frank, 2005).

Expectations of physicians are that they fulfil their role as active participants in the decisions and operations of the health care system. Hence for The Royal College of Physicians and Surgeons of Canada (2005) some important roles of the manager and the related competencies include the following: leadership, supervising others, administration, negotiation, budgeting and finance, managing change, collaborative decision-making, practice management, health human resource, time management, use of information technology, development of a sustainable practice, prioritization, career development, organization, resource allocation, quality assurance, structure and financing, and improvement to the health care system (Frank, 2005).

There is considerable literature (e.g., Prahalad and Hamel, 1990; Teece et al., 1997) on the macro or organizational level of competency development in human capital resource as previously discussed in section 2.9. This is not as evident at the micro-level. There is still a gap in the micro-level analysis of the human capital resource development, or specific micro-level competencies in the RBV (Barney et al., 2011). The specific competencies described by the RCPSC competence framework are vital observable knowledge, skills and attitudes (Frank, 2005). The skills, knowledge and ability to perform a task while focusing on the end result or outcome are illuminated in the push for competency-driven training and education in health care (Frank and Danoff, 2007). In the human capital literature of RBV, these competencies are considered the attributes embedded in the human capital resource, which lead to a greater competitive advantage for a firm (Barney, 1997; Hitt et al., 1998; Selznick, 1957; Hall, 1993; Teece, 2007). The specific focus on the micro-foundational analysis of the human capital resource (e.g., Garbuio et al., 2011) is needed to support the poorly understood concepts in the RBV literature. This exploration is vital to the continued development and support of the RBV (Barney et al., 2011). As previously stated in chapter1, section 1.1, the study's aim is to explore the micro-foundation and process of human capital resource development at an individual level of analysis of the RBV in a knowledge rich environment. The study specifically examines two key aspects of the micro-foundations of the RBV and the process of resource development in support of the RBV concepts and fills the gaps in the literature.

In Summary, following the development of the study framework, exploration of the background concepts and theory, relevant literature review and the establishing the research aim, the next chapter is a detailed overview of the research design and methodology strategy taken for the study. Chapter 5 explores the ontological and epistemological considerations and the various strategies of inquiry and specific method approaches of data collection and analysis. In addition, chapter 5 will discuss the development of the main survey through implementation of a pilot study and the subsequent method and data analysis strategy for the questionnaire.

Chapter 5

Research Design and Methodology

5.1 Introduction

The purpose of this chapter is to discuss the essential aspects of the research design used in the present study to investigate the development of human capital resources for medical professionals in the health care sector. The chapter outlines the research design framework, also discussing ontological assumptions and epistemological position. It establishes the process of reasoning, inductive and deductive, for the study and explains the methodological strategy choice for the study of qualitative, quantitative and mixed methods. The chapter also discusses all the stages of inquiry and methods of data collection strategy. The definition of science may be debatable; however, for research purposes it may be described as a method of inquiry for learning and knowing (Babbie, 2001). In social or natural science, the common feature is seeking explanations and putting the explanation to a test (Steuer, 2003).

The goal of the research design and methodology is to set up a framework to help answer the central empirical research questions as outlined in Chapter 1 (section, 1.3.2).

1. What is the relationship between management training and education and the embedding of individual level attributes in human capital resource development?

2. In the development of human capital as part of resource development, how do different types of management training and education affect the individual attributes of medical professionals as self-reported through ratings of confidence and competency in the discharge of managerial tasks by individual practitioners?

5.2 Grand Theory versus Middle Range Theory Contribution

The research methods chosen play an important part in the possible theoretical contribution to be made. Research contributions may be made towards a grand theory or middle-range theory. The grand theory as articulated by American sociologist C. Wright Mills (1959) has been described as a primary aim of social science to construct a unified theory of the nature of man and society (Skinner, 1986). A middle range theory coined by Robert K Mertan (1967) as theories lying somewhere in-between the developing minor working explanations of research questions and the systematic efforts to develop general theories of social systems or a grand theory. The middle range theory was further interpreted on two principles of, first, aim to consolidate fragmented and separated empirical regularities; and second the acknowledgement that it was unpromising to determine the overarching or all encompassing independent variable that would function in all social science processes (Boudon, 1991, Merton, 1967).

In first examining the grand theory approach, one can open the book and examine the existing theories that may possibly fit neatly into the present thesis contribution. It is important to look once again at the gaps in the literature in the area of confidence and, particularly, competency (Flanders et al., 1983; Nordhaug and Gronhaug, 1994). The RBV of the firm is less developed in the grand theoretical perspective because of the many challenges related to defining and understanding concepts from the multiple perspective and frames of references (e.g., economics, behavioural science, and social sciences). There is a drive towards the building and acceptance of a theoretical foundation and framework along the influential contributions of Penrose (1959), Rumelt (1984), Wernerfelt (1984), Dierickx and Cool (1989), and Barney, 1991. The contribution towards a grand theoretical approach for the RBV is challenging because of the ill-defined and vague concepts (Priem and Butler, 2001a). There are definite challenges to the grand theoretical approach in light of this developing framework of the RBV and acceptance of a stream of thought in terms of a discipline. This criticism brings into question the usefulness of the RBV perspective to the understanding of strategic management issues.

Given the challenges in theory development within the RBV a focus on middle-range theory seems more appropriate. In the middle-range theoretical approach, the central aim for theory development is done by integrating theory and empirical research (Gooner and Nadler, 2012). The middle-range theoretical approach, unlike the grand theoretical approach of verifying broad abstract phenomena, begins with empirical phenomena and extracts general statements that can be verified by data (Merton, 1968; Boudon, 1991). The support for the middle-range theoretical approach for contribution is based on the premises that the weakness in the grand theory lies in the challenge and improbability of confirming or verifying overarching constructs and theories that encompass all empirical observations of interest for complex domains or spheres of interest (Boudon, 1991; Gooner and Nadler, 2012; Merton, 1968). The approach for theories instead should focus on consolidating or integrating the diffuse and segregated empirical observations (Merton, 1968).

In the present dissertation, the challenges of codifying and translating data collected by qualitative or quantitative methodology inherently leads to making a choice of whether to contribute to an existing grand theory or to a middle-range theory. As pointed out, the many challenges and weaknesses in the present stage of the grand RBV theoretical development has made the mid-range theoretical contribution option more appealing. In the study, overcoming these challenges leads to choosing to evaluate and explain the empirical phenomena derived from the data collected in line with middle-range theory contribution.

5.3 Research Design and Framework

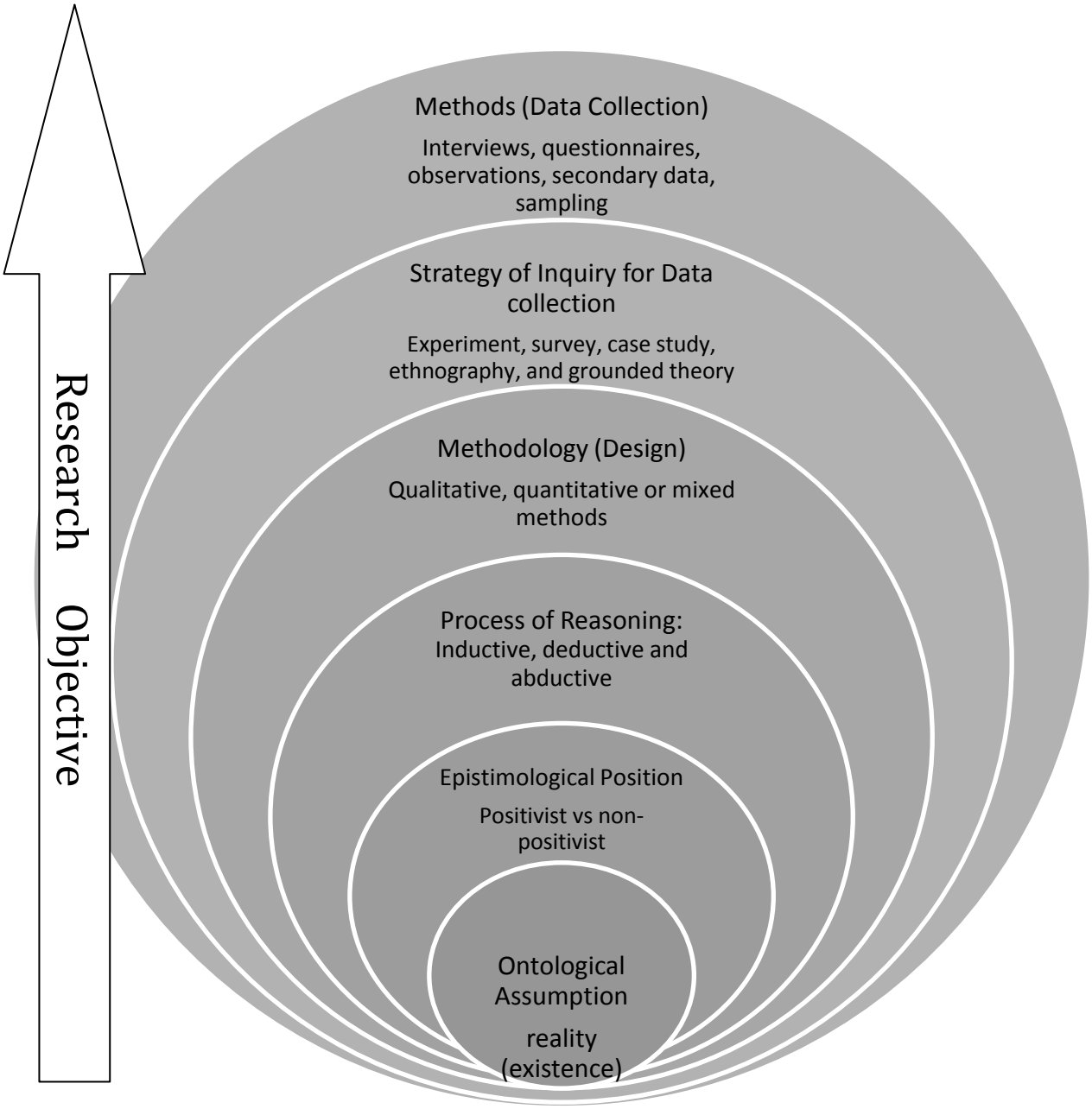
The components of the design process of research are the questions, theoretical lens, data collection, data analysis, write-up and validation (Creswell, 2003). In a further breakdown of designing a research strategy, the analytical process can be divided into seven elements: aim, design, methods, management, data collection, analysis and presentation (Clark and Causer, 1991). These sequential steps are all important, beginning with the element of inquiry focusing on the research problem and central questions.

The research design is an important step in laying out a plan to deal with the method of discovery following from the research question. Research design is concerned with the structure of the inquiry while maintaining consistency in the philosophical approach and the research objective set forth. In all scientific research, it is central to be bound by a set of rules of inferences on which the research design's validity is supported (King et al., 1994). The research design and process may be viewed as scaffolding onto which the researcher builds the structure in accordance with the research aims and purpose (Crotty, 1998; Vaus, 2001). The general categories in the research design framework begin with the epistemology, followed by the theoretical perspective, methodologies and, finally, the methods (Crotty, 1998).

The research design considerations as illustrated in figure 3 involve initial assumptions and stances on reality, knowledge and reasoning. Once the researcher identifies these assumptions and takes a particular stance, the research design method, strategy on data collection and the specific tools are identified based on the research objective. In brief, the ontological assumption of the researcher on the nature of reality and existence relate to the various assumptions of the phenomena under investigation (Burrell and Morgan, 1979). The epistemological position taken by the researcher deals with how knowledge and meaning are constructed (Babbie and Benaquisto, 2002). These philosophical positions are considered with respect to the research objective (Crotty, 1998). A theoretical perspective of reasoning is chosen in conjunction with the aims of the inquiry (Babbie, 2001). The methodological approach and precise methods and techniques are chosen to carry out the inquiry (Creswell, 2003). Note that figure 3 outlines the various assumptions without implying that ontology or epistemology germinates from the other; rather, these assumptions are in tandem to the research objective. These assumptions and strategies relating to the present research will all be discussed in detail in subsequent sections.

Figure 5.1

Research Design Framework



Source: Author adapted from literatuire review (Babbie and Benaquisto, 2002; Creswell, 2003; Crotty, 1988; Gubba and Lincoln 1994; Tashakkori and Teddlie, 1998)

5.4 Ontological and Epistemological Considerations

The *Ontological Position* relates to the nature of reality, or the elemental components of being or existence (Parkhe, 1993). In social terms, Ontology refers to '…assumptions held about the nature of social reality that is, whether reality is objective and external to the individual, or whether it is subjective and cognitively constructed on an individual basis' (Long et al., 2000: 190). It is these assumptions that are tacit in formulating an epistemological position. *Epistemology* is the study of the foundations of knowledge that examines the nature of the scientific approach and the associated premises (Babbie and Benaquisto, 2002; Frankfort-Nachmias and Nachmias, 1996). The epistemological assumption deals with the relationship between the researcher and the subject of inquiry and what the researcher accepts as valid knowledge (Collis and Hussey, 2009).

In developing a research design framework there are a number of ways in which to frame knowledge claims. Knowledge claims may be viewed in either an objective, subjective or constructivist sense (Crotty, 1988). Similarly, knowledge claims may be framed as paradigms along a two-dimensional range of subjectivity and objectivity (Burell and Morgan, 1979). In this latter framing, the researcher may be viewed as somewhere along the range between positivist and anti-positivist ends (Burrell and Morgan, 1979). The *positivist* philosophical view, with its roots in the physical sciences, was advocated by prominent sociology scholars such as Auguste Compte and Emile Durkheim for the study and understanding of social behaviour (Jackson, 2003). In this view, 'the social world exists externally, and that its properties should be measured through objective methods, rather than being inferred subjectively through sensation, reflection or intuition' (Easterby-Smith et al., 2002: 28). The *anti-positivist* philosophical view, on the other end of the spectrum, emphasizes the subjective participation and constructive role on the knowledge of objective reality (Burrell and Morgan, 1979). This philosophical view focuses on the subjective interpretation or the superimposing of an 'analytical framework on empirical observations to render knowledge meaningful' (Astley, 1985: 509). Such anti-positivist views generated the phenomenological or interpretive schools of thought which highlight the differing objects of study

between the natural scientist and the social scientist. In this school of thought, objects of study in the social science, such as humans, have the ability to interpret themselves and the environment, unlike inanimate or non-human objects of study (Singleton and Straits, 1999). This difference is important because it highlights the point that no single epistemological philosophical stance is better than the next. The most suitable philosophical stance depends on the research objective and the subject of inquiry (Saunders et al., 2003). These knowledge claims must not be viewed in a vacuum but with the research aim in mind when choosing and implementing a research approach (Crotty, 1988).

This dissertation works with an ontological position which is subjective in Burrell and Morgan's terms (1979). Thus in this study, it is accepted that respondents when asked about their competence in relation to tasks are offering views which are subjective, social and the product of one's mind rather than external to the individual. The cognitive aspect of self-reported perception of competence is based on this subjective formulation of reality. The research dissertation takes a non-positivist and subjective epistemological position based primarily on a socially constructivist view of reality. Hence realities which are constructed locally or specifically generate meaning for individuals or groups (Guba and Lincoln, 1994; Packer and Goicoechea, 2000). In this sense social phenomena and their meanings are produced and constantly revised by social actors through interaction (Bryman, 2004). The constructivist nature of the self-perceived and reported competence concept is dynamic, with various types and levels of training. This is positioned towards the opposite end of the spectrum from the external reality view taken by the positivist paradigm. Competence may be derived from several sources of input; training may be one of them. This philosophical stance on the dynamic nature of the measured aggregated competence involved is non-positivist, but individual elements of the concepts in a disaggregated form may be considered in and may lead to future positivist tract research.

5.5. Process of Reasoning (Induction, Deduction and Abduction)

Reasoning is the cognitive process of drawing inferences or conclusions from given information (Goel and Dolan, 2004). There are three general approaches to reasoning that can be taken in research. The first, *induction* involves reasoning from specific facts or observations to general principles or discovery of a pattern (Babbie, 2001; Deforest Molina and Spicer, 2004). The second, *deduction*, involves reasoning from general premises or principles to a logical specific case or conclusion (Deforest Molina and Spicer, 2004; Yates, 2004). The third, abduction, involves discovering and interpreting through combining patterns in a phenomenon of collected data (Peirce, C. S., 1867/1960).

Inductive research involves theoretical development from empirical data or observations, whereas deductive research involves testing general premises or theories through empirical observations or focusing on specific data or elements (Collis and Hussey, 2009). In social research, induction may be understood in terms of building general knowledge from the use of impressions and experiences, whereas general knowledge may be deductively used in the understanding of the 'consequences of a particular action' (Rasmussen et al., 2006: 50–51).

- *Inductive process:* Observations/ - Experiences→Data Collection→Findings→Theory Development

- *Deductive process*: Theory→Hypothesis→Data Collection→ Findings→ Hypothesis confirmation or rejection→ Revision of Theory

Source (adapted from Bryman, 2004: 9-10 2)

There may be a duality and combined sequential use of both inductive and deductive reasoning, particularly in mixed-methods methodology (Cooper and Emory, 1995). In research design, inductive and deductive strategies are not always as straightforward. These strategies are best considered research inclinations rather than strict distinction lines (Bryman, 2004). This dissertation takes a mixed-

methods approach, using both inductive and deductive reasoning processes sequentially. The present research follows an inductive process in the largely qualitative exploratory study phase and in the empirical data collection from the larger study. There is also a deductive process in the larger, more comprehensive study. In the deductive process, the theoretical perspective of competitive advantage is examined. The study examines the consequences of a particular action (training) on the development of human capital resource. The resulting data is collected, and the findings lead to the hypothesis, which is tested. The final outcome from testing of the hypothesis is a mid-level theoretical contribution (to theory development or revision).

The process of abduction in research was introduced by American philosopher Charles Sanders Peirce who is well known for his contribution to the pragmatic school of philosophy (Levin-Rozalis, 2000). Abduction involves discovering and interpreting through combining patterns in a phenomenon of collected data (Peirce, C. S., 1867/1960). Abductive reasoning is useful in exploring possible paths to further inquiry by deriving a plausible hypothesis or explanations from the interpretation of the collected data pattern (Paul, 1993; Yu, 1994). There is a close relationship of Induction and abduction. Induction is an argument which sets out from a hypothesis resulting from a previous abduction or from implicit predictions drawn by deductions (Peirce, C. S., 1867/1960, Frankfort, 1958). Abduction is used to synthesize an explanation which is thereafter verified by induction (Paul, 1993).

5.6 Methodological Design (Quantitative, Qualitative and Mixed Methods Approaches)

In the data collection and analysis, strategies may be considered from three broad methodological approaches. The three approaches are quantitative, qualitative and mixed methods. The appropriateness or suitability of a particular methodological approach chosen is determined by the focus, aim and objective of the research. The choice of quantitative, qualitative or mixed-methods is influenced by the ontological stance, knowledge claims, strategies and methods (Creswell, 2003). The data collected or the analysis of the data may fall into either or both approaches.

In social science research, the *quantitative approach* is used to determine the quantity or numerical extent of a phenomenon or human behaviour (Zikmund, 2003, Jackson, 2003). The quantitative approach tends to describe relationships of variables mathematically, and analysis is performed numerically (Jackson, 2003). When the aim of the research is to provide an in-depth understanding of concepts and of the problem itself, rather than numerical quantification or exact measurements, the method may be framed as a *qualitative approach* (Zikmund, 2003). In a qualitative methods approach, the non-numerical 'examinations and interpretations of observations' are used to discover and explain 'underlying meanings and patterns of relationships' (Babbie, 1999: 458). There are many tendencies and propensities (e.g., purpose, conceptual framework, research aim /question, data collection methods, validity and so on) of each method of research. Table 5.1 provides a useful summary description of the various quantitative and qualitative methodological approaches and their typical tendencies as listed in the margins.

Table 5.1 Comparison of Quantitative and Qualitative Methodological Approaches

Typical tendency /leanings	Quantitative	Qualitative
Purpose	Precise measurements and comparison of variables	Meaning, context, process, discovery (unanticipated events, influences and conditions), understanding of single cases, inductive development of theory
Conceptual framework	Variance theories	Process theories
research questions	Variance questions (i.e., truth of proposition, presence or absence, degree or amount, correlation), Hypothesis testing, Causality (factual)	Process questions (i.e., how and why), meaning, context (holistic), hypothesis as a part of conceptual framework, causality (physical)
Research problems /data questions	Confirmatory, outcome based	Exploratory, process based, descriptive, phenomenon based
Relationship	Objectivity, reduction of influence (researcher as extraneous variable)	Use of influence as a tool for understanding (researcher as a part of the process)
Sampling	Probability sampling, establishing valid comparisons	Purposeful sampling
Data Collection methods	Prior development of instruments, standardization, measurement testing-quantitative/categorical, instruments, observations, documents, score oriented, closed-ended process, predetermined hypothesis	Inductive development of strategies, adapting to particular situations, interviews, documents, observations, audiovisual, participant-determined process, open-ended process, text/image oriented
Data Analysis Procedures	Numerical, descriptive statistics, inferential statistics (correlation), estimation of population variables, statistical hypothesis testing, conversion of textual data into numeric or categories	Description, identify themes/categories, look for inter-connectedness among categories,/themes (vertically and horizontally)
Data Interpretation	Generalization, prediction based, interpretation of theory	Particularization (contextualization), larger sense making, personal interpretation, asking questions
Validity	Statistical conclusion, construct, causal (control of extraneous variables)	Descriptive, interpretive, construct, causal (identification and assessment of alternative explanations)
Generalizability	External validity (comparability)	Transferability, generalizing to theory

Source: adapted—Creswell et el, 2003:221 table 8.2; Maxwell and Loomis, 2003:,252 table 9.1

In the past it has been suggested that qualitative and quantitative research are divergently linked to either exploratory or confirmatory questions (Teddlie and Tashakkori, 1998). This has been challenged, in that either qualitative or quantitative research can be used for theory generation or verification (Punch, 1998). There is an overlap of techniques and approaches to the various frameworks and research designs. The distinctions for the terms, qualitative and quantitative, may be considered through degrees on a continuum, based on certain criteria. There are several criteria to consider in defining qualitative and quantitative research techniques or approaches. These criteria include the analysis in converting observations into numbers, types of questions posed, appropriateness of the evidence in answering the questions, and choice of methodology used to process the evidence (Jackson, 2003). The quantitative and qualitative approaches may be characterized or associated within a particular knowledge claim or paradigm, but each of these approaches can cross into one or more knowledge claims, paradigms or research design strategies.

It would be inaccurate to imply that there is an absolute division on all positivist and non-positivist research into qualitative and quantitative camps. The separation and categorising of objectivist research with quantitative methods versus the constructionist or subjectivist research with qualitative methods has been challenged by Crotty, 1988: 15):

This partition 'is far from justified…Most methodologies known today as forms of "qualitative research" have in the past been carried out in an utterly empiricist, positive manner. This is true as already noted, of the early history of ethnography. On the other hand, quantification is by no means ruled out within non-positive research…'.

Each of the methods, separately or both together, may serve the research purpose in a positivist or non-positivist epistemological stance. There is a considerable amount of grey area in each approach, and the distinction does not necessarily imply that a particular research needs to be boxed exclusively into one approach (Babbie and Benaquisto, 2002).

5.6.1 Mixed-Methods Approach to Research

The limitations and the differing strengths and weaknesses of using either qualitative or quantitative method approaches on its own led to a combined approach. In contrast to a traditional purist approach of either quantitative or qualitative methods, a more contemporary use of both methodologies, a third methods technique to research, is the *mixed-methods approach*. The use of a mixed approach was developed with the goal of improving or enhancing the accuracy of 'judgments by collecting different kinds of data bearing on the same phenomenon' (Jick, 1979: 602). This combined approach was born out of synergistic argument of triangulation. Triangulation, or 'the combination of methodologies in the study of the same phenomenon' (Denzin, 1978: 291), is advocated by several scholars (e.g., Denzin, 1978; Smith, 1975; Webb et al., 1966). The combined methodological approach described by SD Sieber (1973) of using qualitative method techniques of observations and interviews along with quantitative method techniques of surveys harnessed the strength of each to overcome the weakness of the other (Creswell, 2003). The mixed-methods approach tends to lean towards the pragmatic philosophical knowledge claim (Johnson and Onwuegbuzie, 2004).For example, John Dewey's (1902) central emphasis on experience in education was philosophically pragmatic in nature, much like the use of mixed method approach. This empirical epistemology posited that the possibility of knowledge acquisition developed from the fact that 'we were our experiences, and education—as the pragmatic ability to solve problems—was a simple job of discovering dimensions of reality and making meanings from it for ourselves in relations to others and experiences of others' (Trifonas and Ghiraldelli Jr, 2004;141). The pragmatic philosophical knowledge claim is used to gain advantages of each of the other two methods (Brewer and Hunter, 1989; Kumar, 2007; Patton, 1990). The qualitative and quantitative method approaches may be used either simultaneously or sequentially to collect numerical or text data (Creswell, 2003). The differences or tendencies of philosophical assumptions, strategies, and methods of inquiry of the qualitative, quantitative and mixed approaches are outlined below in table 5.2.

Table 5.2 Overview of Quantitative, Qualitative and Mixed Method Approaches

Trend	Quantitative	Qualitative	Mixed
Knowledge Claim	Post-positivist	Constructivist	Pragmatic
Strategy of Inquiry	Experimental Survey	Narratives Case Study Phenomenology Ethnography Grounded theory	Sequential Transformative Concurrent
Method of questioning employed	Closed-ended	Open-ended	Both
Other methods employed	Numeric data Predetermined approaches	Text Image Emerging approaches	Both qualitative and quantitative data and analysis Both emerging and predetermined approaches
Adapted from (Source): Creswell, 2003:19-20 table 1.4 and Figure 1.2			

There is an associated pluralistic, problem-solving and consequential orientation to the mixed-methods approach (Creswell, 2003; Tashakkori and Teddlie, 1998). Although this assertion and link to paradigms may have some support, 'both qualitative and quantitative methods may be used with any paradigm' (Gubba and Lincoln 1994: 105). The research focus and objective determines which one (or both) is suitable. A major advantage of using mixed methods is that it allows the researcher to answer both exploratory and confirmatory questions simultaneously, to 'therefore verify and generate theory in the same study' (Tashakkori and Teddlie, 2003: 15). In the research, I chose the mixed-methods approach for this reason. The present research aims to achieve the same mixed objectives of

contribution towards midlevel theory generation and theory verification. Thus, the study is divided into an initial exploratory (pilot study) and a confirmatory (survey study).

There are several strategies in using the mixed methods approach, as illustrated by table 5.3. The theoretical thrust and sequences vary with respect to the research objective. The typologies of mixed methods design were developed by scholars (e.g., Greene et al., 1989; Morse, 1991) to give structure and a standard point of reference for the emerging research method (Tashakkori and Teddlie, 2003). The inductive or deductive theoretical drives for the different mixed-methods design sequences (Morse, 2003) are presented in table 5.3. Each of the chosen sequences in table 5.3 is linked to either an inductive or deductive primary research aim. The study takes an initial qualitative approach in developing the survey, followed by a quantitative approach through the use of the survey.

Table 5.3

Mixed-method Designs	(QUAL for qualitative and QUAN for quantitative)
Inductive Theoretical Drive	**Deductive Theoretical Drive**
QUAL + QUAL (simultaneous)	QUAN + QUAN (simultaneous)
QUAL---> QUAL (sequences)	QUAN---> QUAN (sequences)
QUAL + QUAN (simultaneous)	QUAN + QUAL (simultaneous)
QUAL---> QUAN (sequences)	QUAN---> QUAL (sequences)

Source: Adapted from Morse, 2003: 197

The sampling strategy in the inductive theoretical drive design contains a 'small purposeful sample' for the qualitative study and a 'larger randomly selected sample' for the quantitative study (Morse, 2003: 203). This is the strategy I followed in the research study; the qualitative part includes a small sample size of five (in-depth interviews with semi-structured, open-ended questions) combined with data from the literature review. The second, quantitative part includes a larger sample size of 258 (questionnaire with numerical ordinal rankings). In the study, I collected qualitative data first to explore a phenomenon; and then I collected quantitative data through the questionnaire to explain the relationships found in the initial qualitative data. Other typologies of mixed methods have varied according to the criteria set. Table 5.4 from Creswell et al. (2003: 218) outlined a typology matrix that is helpful during the decisions phase for researchers carrying out mixed-methods research.

Table 5.4 Mixed Methods Convergence Typology Matrix

<table>
<tr><th>Implementation</th><th>Priority</th><th>Integration</th><th>Theoretical Perspective</th></tr>
<tr><td>No sequence
Concurrent</td><td>Equal</td><td>At Data Collection</td><td rowspan="3">Explicit</td></tr>
<tr><td>Sequential
Qualitative First</td><td>Qualitative</td><td>At Data Analysis</td></tr>
<tr><td rowspan="2">Sequential
Quantitative First</td><td rowspan="2">Quantitative</td><td rowspan="2">At Data Interpretation</td></tr>
<tr><td>With some combination</td><td>Implicit</td></tr>
<tr><td colspan="4">Source: Creswell et el., 2003:218 (figure 8.3) Decision Choices for Determining a Mixed method Strategy of Inquiry</td></tr>
</table>

5.7 Strategy of Inquiry for Data Collection

The Strategy of Inquiry is the research design procedures that make up the framework for the collection and analysis of data **(**Bryman, 2004; Williamson, 1982). It is the strategy for the 'generation of evidence' that is suited to certain criteria under the qualitative and quantitative methodological approaches and for the research question (Bryman, 2004: 26). There are a number of strategies of inquiry, including experiment, survey, ethnography, case study, observational, content analysis, secondary data analysis and the grounded theory approach (this is discussed in detail in table 6.5 and section 6.7). Each one may be best suited to a different qualitative, quantitative or mixed-methods approach in line with the objective of the research. Prior to choosing a strategy of inquiry or the specific research design procedure, the researcher should consider the merits and limitations of each in gaining evidence for the research question.

5.7.1 Methods of Data Collection

The specific techniques and methods of data collection in generating evidence to meet the research objectives need to be carefully chosen and organized. This is done to obtain validity and reliability in the findings and to uncover the answers to the original research questions. The specific techniques commonly associated with qualitative data collections include interviews, observations, use of audio-visual aids, participant-determined process, open-ended process, and text and image data. On the other side, techniques commonly associated with the quantitative data collection include closed-ended questions, predetermined approaches, and numerical data (Creswell, 2003: 19; Maxwell and Loomis, 2003).

Table 5.5 is a brief summary outline of the strategies of inquiry in a research design procedure for various data collection methods are derived from multiple sources (e.g., Babbie, 1990; Babbie and Benaquisto, 2002; Bryman, 2004; Creswell, 2003; Del Belso and Lewis, 2005; Hair et al., 2003).

Table 5.5

Strategies of Inquiry (Research Design Procedures)

Data Collection Methods	Description of data collection	Positive aspects	Negative aspects
Survey	Cross-sectional or longitudinal studies Generalized from a sample to a population Collection of primary data from individuals *Interview*: Individual or group *Questionnaire*: administered or self-administered Information collected: range from general information, beliefs, opinions, and attitudes to lifestyle Various survey methods: face to face, mail, electronic (computer online), phone, etc.	Large sample can be tested (if there is easier recruiting) Generalizability of findings May be easy to administer Time efficiency (e.g., use of computer for recording) Low cost depending on the method (e.g., internet survey) Privacy for participants Ease of statistical analysis with numeric data and codified narrative data Descriptive and explanatory data	Low response rates Limitations on complex concepts and issues Response bias due to certain types of questions (e.g., closed-ended) Statistical concerns (reliability/validity) Difficult to obtain hidden aspects of on-going, changing patterns of processes on a longer timeline
Experiments	Causal design: manipulation of aspect of a situation (control potential cause) to observe any corresponding resulting change (in hypothesis) Cause and effect	Establishment of causality Control and manipulation of variables Better control of validity and reliability issues	Limitations on complex concepts, meanings and process issues High cost Ethical and legal burdens and constraints

	relationship focus Types: Lab or field experiments		Challenging to recruit participants
Case study	An in-depth investigation of an occurrence, activity, program, process; an individual or group	Detailed information Comprehensive and thorough Illumination of multifaceted or multi-perspective process along a timeline	Time consuming Expensive Small sample size limiting the ability to generalize Relying greatly on subjective analytical skills of researcher
Exploratory Study	Initial investigation of a new subject or phenomenon A new area of interest for the researcher	Insights into emerging topic or new interest Can evaluate feasibility for further larger studies Helps to develop strategies and methods for subsequent studies	May provide a glimpse to possible answers but falls short of providing definitive answers to the research questions Small sample size may not be representative of larger population
Grounded research	Seeks out a general abstract theory of a process, action or interaction based on the views of the participants Collecting and analysing data, observations, experience for theory development	Systemic development or generation of new theories	Challenges in ability to generalize, and reliability

Action Research	Collaboration between researcher and client in identification and diagnosis of a problem leading to the development of a solution	Practical insights and implications Targeted and precise insights	Researcher involvement (influence) as part of study More practical usefulness and less academic Time demands Difficulty in gaining complete access to firm
Observations (in general)	Recording observations systematically of objects, people or events Human, mechanical or electronic observation (written, recorded or audio)	Avoids researcher bias (without instructions or interaction)	Cannot record unseen characteristics Privacy issues
Ethnography	Observation and Interpretation of behaviour of a cultural group in real-life experiences or natural setting	In-depth information (multi-perspective) leading to identifying causality Identifying components and facets of longer processes (time related) Flexible process	Difficulty in gaining access Researcher (active or passive) bias and interpretation Time consuming and on-going access requirements Issues surrounding overt versus covert observations (i.e., ethical and biases)
Content analysis	A thorough, in-depth examination of repeated themes and meanings in communications, messages and documents	Large amount of data in all places (as well as mass media) Easily accessible data Inexpensive technique Avoids researcher bias (non-reactive, without instructions or interaction)	Concerns with the reliability in coding (researcher subjectivity) Difficulty in validating interpretation of meanings in data which may contain contradictory, ambiguous or hidden meanings in communications

Secondary Data Analysis	Reorganization, reinterpretation, and analysis of available data (from government, organization, or firm) Indirect, non-reactive research	Available data (would be costly and require large resources to re-collect) Possible to challenge original interpretation and meanings with the same data Investigate different chosen issues of interest than the original published focus of the same data	Cannot change the process or methods of data collection Cannot change the required information (may require different or more information) Large data requires time and thorough investigation to narrow useful parts from non-useful parts Expensive fees to obtain certain data
Table Source: Author from Literature review, adapted (Babbie, 1990; Babbie and Benaquisto, 2002; Bryman, 2004; Creswell, 2003; Del Belso and Lewis, 2005; Hair, Babin, Money, and Samouel, 2003)			

Each strategy of inquiry is based on a particular position on the subjectivity-objectivity scale (Burrell and Morgan, 1979; Creswell, 2003). Instead of focusing exclusively on either of the two stances separately, one can view them along a range, as illustrated in table 5.6. They can be viewed as tendencies that are chosen for their suitability to the research objective. This perspective avoids boxing the research into opposing camps. The research inquiry strategy is determined by the aims of the researcher along these key ontological and epistemological assumptions (Morgan and Smircich, 1980).

Table 5.6 illustrates the framework range outlined by Burrell and Morgan (1979) and illustrates the subjective and objective aspects of the ontological, epistemological, methodological and other stances taken in the research process. It outlines the directions along a range in the dimensions rather than compartmentalized extremes, as discussed in section 5.2, along with their ontological and epistemological stance.

Table 5.6

Subjective-Objective Dimension Range

	Subjective Range **Objective**	
Ontology	Nominalism	Realism
Epistemology	Anti-positivism	Positivism
Process of Reasoning	Inductive	Deductive
Human Nature:	Voluntarism	Determinism
Methodology:	Ideographic	Nomothetic
Research approach	Qualitative	Quantitative
Source: Adapted from: Burrell, Gibson and Morgan, 1979: 3).		
Strategy of inquiry	Exploratory study; case study; ethnography, action research	Survey; experiment
Methods	Interviews; observations; Text and image analysis	Questionnaire; statistical analysis; performance data
Source: Adapted from Creswell (2003)		

5.8 The Research Rationale of the Pilot Study

This study supports the view that it is possible to deduce a testable empirical assertion from the RBV (Barney, 2001). The assertion made here is that individual, self-reported competency offers a means of gauging the development of internal resource bundles. This study does not investigate those organizationally embedded resource bundles but rather examines the individual-level perspective on human capital resource bundles. Further, individual, self-reported and rated data does not equate to competitive outcomes but rather serves as a necessary pre-condition for research which would test such outcomes. Economic value or net benefit derived from developing rare and difficult-to-imitate competencies or resources, in turn leads to a firm gaining competitive advantage.

This study occurred in six stages of incorporating the literature review and data collection covering a sequential mix of methods as discussed in section 5.10. The first part of the method sequence involved an initial qualitative pilot study in the creation of a survey for the main study.

5.9 The Research Approach in the Creation of the Main Survey

Following the pilot study, the main survey serves to obtain answers to the research questions of the study. Such a qualitative-quantitative approach sequence is described by Morse (2003) as an inductive theoretical approach. In the qualitative phase, a pilot study is used to generate the instruments and variables to be used in the development of the main survey. In the pilot study, in-depth interviews of a very small sample are used to generate empirical data to create instruments and variable categories. The pilot study of this thesis uses the grounded-theory method in the generation of instruments and variables for the survey through coding and categorization. The pilot study used in this research is discussed in greater detail in section 5.10.

5.9.1 Grounded Theory Method

The premise that good or worthwhile research should be predicated on the verification of previous work appears limited in terms of expanding intellectual capacity (Glaser and Strauss, 1967). Barney Glaser and Anselm Strauss developed the origins of formal grounded theory from a descriptive approach to dealing with and interpreting qualitative data, and they articulated on it in their 1967 publication 'The Discovery of Grounded Theory' (Seale, 2004). Grounded theory proposed a research methodology aimed to generate new theories rather than to test and verify the existing grand theories of human behaviour (McGhee et al., 2007; Urquhart, 2001). What began as a contribution to the methodology of sociology has now infiltrated many other social science disciplines, such as psychology, education, information sciences, management and organization studies (Locke, 2001). In the past, quantitative methodology and data were understood by many to use facts to test unconfirmed theories, and in this respect, qualitative methodology and the resulting data had questionable usefulness. However, Glaser and Strauss (1967) supported the notion that both qualitative and quantitative methodology and data could be employed in the verification and generation of theory.

5.9.2 Debates about Grounded Theory

Since developing grounded theory the two original authors, Glaser and Strauss, have had fundamental disagreements regarding both method and application. There have been numerous debates on the versions put forward by each author (e.g., Heath and Cowley, 2004; Melia, 1996; Mill et al., 2006; Walker and Myrick, 2006). A thorough understanding and awareness of the current debate surrounding the use of grounded theory methodology is important (e.g., Dey, 1999; Glaser, 1978, 1992, 1995, 1998; Strauss, 1987; Strauss and Corbin, 1990a, 1994, 1998). The debate over whose version is the more valid intensified as each voiced his opinion and authored his dictum in alternating literary works. The works produced by Glaser, *Theoretical Sensitivity* in 1978 and *Grounded Theory Analysis* in 1992, were matched by the works from Strauss, *Qualitative Analysis for Social Scientists* in 1987 and *Basics of Qualitative Research* in 1990 and 1998, the latter co-authored with Corbin (LaRossa, 2005).

The differing versions of the grounded theory method have been described as 'purist' for Glaser, versus 'evolving' for Strauss and Corbin (Mills et al., 2006). Some scholars (e.g., Charmaz, 2000; Warburton, 2005) have argued that, ontologically, Glaser's version reflects a positivist leaning and is epistemologically objectivist in the empirical tradition of the Chicago School, while Strauss's version reflects a non-positivist leaning that is epistemologically more interpretivist. The Strauss and Corbin work (1990, 1998) has been further discussed and analysed with respect to concepts of theoretical sensitivity, and the role of literature. The other areas also considered and highlighted are secondary data, validity, coding, diagrams, and categories. It has been examined in a constructivist approach to inquiry (e.g., Charmaz, 2000; Mills et al., 2006). Strauss's 1987 version, as well as the later versions co-authored with Corbin in 1990 and 1998, favour an approach in which the coding paradigm serves as a more structured theoretical framework and follows in the tradition of pragmatic rooting as described by Mead and Dewey (Kelle, 2005; Warburton, 2005). Glaser (1992) argued that the application of the grounded theory according to Strauss and Corbin's method (1990, 1998), forces data and categories instead of allowing the data and categories to emerge. The issue of forcing versus

emerging for Glaser (1992) was argued in the context of in the coding procedure. The argument against forcing was implied in the context of Strauss and Corbin's (1990) data analysis method of axial coding, coding paradigms, and literature review. Glaser (1992) criticized these prescriptive methods as not follow the true path of grounded theory approach, which makes an effort not to contaminate, bind, hinder, or drown out the efforts of the researcher to create or develop categories.

Technically and philosophically, one can employ various coding procedures and a number of phases of coding methods, depending on the strategy one follows (e.g., Glaser, 1978, 1992; Glaser and Strauss, 1967; Strauss, 1987; Strauss and Corbin, 1990a). The contribution of grounded theory develops from data and from a qualitative inquiry to generate a theory, or to provide an incremental contribution towards future theoretical development. Although Glaser and Strauss (1967) agree that the main goal of grounded theory is to generate theory, researchers have also used the method without producing a theory, or have used the method as part of an approach that does not seek to develop grounded theories (Bryant, 2002). The grounded theory approach used in the pilot study of this research was not used to generate a theory to explore research claims, as the Glaser version of the method would maintain. Yet although the pilot study alone does not generate a theory and is only a means to generate categories for the main survey, it does require empirical grounding of the data, as required by the grounded theory method. The need to code the qualitative data obtained from the pilot study for the main survey required choosing a particular interpretation of the grounded theory data method analysis. The choice for the pilot study relied on the concept of a coding paradigm as described by Strauss and Corbin (1990, 1998), which then served as a theoretical framework to guide the development of the empirically grounded categories used in the main survey.

There is still a lack of consensus about the pluralistic nature of the grounded theory method when it comes to the steps, or procedures, in codifying and categorizing data. Initially Glaser and Strauss (1967) acknowledged the need for other scholars to codify their own methods for generating theory. This approach, using the Strauss and Corbin grounded theory, was used to generate the instruments and categories

through a coding process of constant comparison. An inductive approach was taken with regards to theory, bearing in mind the role of literature sensitivities. This was more structured than the Glaser approach but still allowed for data emergence, because the bulk of the literature review was done after the preliminary coding and categorization.

5.9.3 Grounded Theory Method and Dealing with Relevant Literature

One of the issues most frequently debated in applying the grounded theory method is the role of the literature review. The purpose of imposing restrictions when dealing with literature is to ensure that any future research approach is inductive rather than deductive, thereby allowing the data to emerge rather than imposing or forcing concepts onto the data (Urguhart, 2001). It has been argued (e.g., Urguhart, 2001) that the notion of ignoring all existing literature, in the setting aside of all theoretical ideas, is not an accurate representation of the grounded theory method position of either Glaser or Strauss. The order of placement of a literature review is hotly debated by Glaser on one side and by Strauss and Corbin on the other: Glaser, in his 1992 manuscript, stressed the inherent problems in Strauss and Corbin's (1990, 1998) argument for letting experience and literature play a role in the generation of concepts. Glaser argued that this method again forces the data, instead of letting it emerge from theory generation (Allen, 2010). Glaser (1992) advocates restricting all topic-related literature reviews prior to the emergence of the categories from the coding of the empirical data. Strauss and Corbin, in 1990, on the other hand, advocate a literature review early in the research because it increases theoretical sensitivity, is a good source of secondary data, guides theoretical sampling, provides supplementary validity, and stimulates further inquiry (McGhee et al., 2007).

The contention regarding emerging versus forced data can also be viewed from a personal perspective: Researchers are encouraged to openly recognize the possible influence of their prior experience or professional work on their chosen perspective (Charmaz, 2000). Acknowledging this, that there is some knowledge and awareness of the relevant concepts and literature prior to this PhD study due to my

professional and academic training in health care and management, my aim was to follow the Strauss and Corbins (1990) prescriptive approach of coding in which categories are generated with some role of prior literature. Although the Strauss and Corbin (1990, 1998) approach to the grounded theory method allows for a limited role of literature prior to data coding, the vast majority of the literature review for the pilot study was conducted after selective coding for the generation of the categories. Only after the categories for the main survey began to emerge did I consult the literature and relate it to the empirical findings. Thus, approach was primarily inductive in nature in that observations informed theoretical and conceptual reasoning.

Once the necessary preconditions of the clinical and management category generation were met in the pilot study, the variables were incorporated into the creation of the main survey study (see appendix 1). As previously discussed in section 5.4, the main survey study was a deductive, quantitative study using a large sample size of medical professionals (physicians) and explored the research claims. The method of data collection for the pilot study and for the main survey study is discussed in more detail in section 5.9.

5.10 Method: Stages of Incorporating the Literature Review and Data Collection

Initially an in-depth literature review was conducted with the goal of identifying and focusing on the gaps in the RBV literature. This led to a focus on the empirical gaps in determining, valuing or measuring aspects of individual level human capital resource which lead to competitive advantage for a firm. The primary objective was to empirically identify the link between development of human capital resource and competitive advantage through value creation, or net benefit, as indicated by self-reported competency ranked measurements as stated in the research aim and question, in chapter 1, section 1.3.1. This involved an extensive literature review; more specifically in the phenomena of competitiveness through the human capital side of the RBV perspective. The dissertation offers a possible way forward in developing an empirical approach for future research to identify how resources are embedded and to quantify conceptual categories or attributes of

intangible human capital resources for inferential analysis. The differences in resulting measurements of competency from the generated ordinal scale indicate inter-firm differences in the development of the human capital resource bundle.

Next, the focus turned to an in-depth iteration of historical and contemporary literature in the RBV as pertains to its possible link to competitiveness (Barney, 1991; Dierickx and Cool, 1989; Penrose, 1959; Priem and Butler, 2001; Rumelt, 1984; Teece, 1998; Wernerfelt, 1984) and the conceptual and empirical limitations encountered (Ghemawat, 1991; Priem and Butler, 2001; Porter, 1994) within this view. These limitations were evident for the existing and developing perspective and help to explain competitiveness through conceptually identifying competency measurements of heterogeneous human capital resources. A choice was made to examine self-reporting competencies and confidence measurements for identified important (clinical and management) skills and tasks as part of the human capital resource in the health care sector.

The third stage involved the pilot study in the health care sector of medical professionals. The pilot study is important and useful because it helps in assessing the viability, cost, methods and data analysis for a larger future study (Beebe, 2007). Strategic management as a relatively new developing field presents ample opportunity to make a contribution to the early development of concepts and constructs. From this perspective, a pilot study is useful for investigating a topic about which there is limited prior research to navigate or focus the researcher's attention (Del Baso and Lewis, 2005). There are three other important criteria for beginning the inquiry or research with a pilot study. These are related to (first) the researcher's interest and desire for understanding a phenomenon; (second) the feasibility of undertaking a larger future study; and (third) development of methods for future studies (Babbie and Benaquisto, 2002). This is a very open type of research without delineations of clearly marked variables, categories and classifications (Singleton et al., 1993), which makes it challenging for new researchers to organize the fragmented data. There are also limitations on the information acquired from a sample size as being representative of the overall phenomenon or larger population (Babbie and Benaquisto, 2002). Even with these

limitations and challenges, the exploratory study is valuable to social research because it may yield new insight into a complex or emerging topic of research and into useful design methods for further inquiry.

In the research study, I used the pilot study to identify and focus the topic of interest, the development of human capital resource. The study also helps to delineate categories and develop independent and dependent variables to generate evidence to answer the research questions. In this initial phase of the research, I used a qualitative strategy of inquiry and an inductive theoretical perspective. The pilot study involved 45 to 60 minute interviews with five physicians on competency and confidence in clinical and management skills and tasks. The primary subjects chosen were physicians in a highly knowledge-intensive health care sector. They were chosen because they had extensive experience in clinical and administrative management tasks within large and small health care units in Canada. They had intimate knowledge of the clinical and management requirements from their diverse careers and specialities in the hospital or private practice settings.

There are many techniques associated with gathering data from interviews. The three most common types of interviews are the structured, semi-structured and unstructured interviews. The structured interview is usually associated with quantitative studies. In this research, semi-structured interviews with open-ended questions were used to develop and code categories for the subsequent development of the questionnaire survey.

The fourth stage involved identifying prominent and overlapping skills and tasks from the interviews using Strauss and Corbin's (1990, 1998) grounded theory approach in incorporating the literature review after the clinical and management task categories emerged. Skills and tasks were identified from the semi-structured, open-ended questions. These clinical and management skills and tasks derived from the interviews were compared to the skills and tasks represented in the medical education, health care management and human capital resource literature. Identifying the skills and tasks is very important in matching the type of training and education to the workplace requirement and to changes and updates to the

curriculum (Hartman et al., 2005). A list of the clinical and management skills and tasks was created from both the pilot study and the literature review. The specific list of clinical and management skills and tasks was grouped and organized into categories reflecting broader generalized areas encountered in the health care sector.

The fifth stage involved setting up and conducting an online survey questionnaire developed from the pilot study. This survey questionnaire was given to a sample of physicians across Canada. There are various methods of setting up and collecting data, such as in person, through mailing and by telephone. In the Internet and Web era, an efficient method is to set up and collect data via an Internet survey (Strachota et al., 2005). The geographic vastness and the large number of physicians in the Canada made the online survey option ideal for this study. The physicians were identified and contacted from open public sources by phone, mail and email and were requested to take the online survey.

Subsequently, the sixth stage involved the collection and analysis of empirical data using descriptive and inferential statistics. The final analysis involves 'making inferences, drawing implications, making predictions, and providing explanations' which are seen as 'essential for developing conceptual understanding of any topic, process, or system' (Jonassen and Ionas, 2008: 291). Multiple descriptive and inferential statistical non-parametric tests were performed on the collected data set. The data set included differing types of management education completed by physicians and their self-reported ranking of confidence and competency in the tasks. SPSS software was used to perform the various statistical calculations on the collected quantitative data set. Hypothesis and significance testing were undertaken for all the ordinal-ranked confidence and competency measurements in the clinical and management tasks.

5.10.1 Data Analysis Method

Once the data is collected a method of data analysis is used to extract information about the topic of investigation. Descriptive statistics are used to organize, summarize and establish the basic features of the data from a sample or population, The descriptive statistics uses the median, mode, standard deviation and variance in describing the data in a condensed or symbolic manner (Salkind, 2007; Sprinthall, 2000). Inferential statistics are used to make inferences or draw conclusions about the characteristics or estimates of the results based on a sample to a wider population (Miethe and Gauthier, 2008). The study initially presents descriptive statistics about the data collected (i.e., description of the population sample with respect to their type of management training and their self-ratings of confidence and competence) from the sample population. This is followed by inferential data analysis for the study, in which inferences from the data of the sample of medical professionals (physicians) is used to infer or draw conclusions of the wider medical professional (physicians) population. In the inferential statistic data analysis the test for significance is important in determining if the differences in two groups is due to variable or systematic influence or due to chance alone (Salkind, 2007). The study analysis the quantitative data and discusses in-depth the significance, null hypothesis and the specific statistical test used in chapter 7.

5.10.2 Statistical Testing: Parametric verse Non-Parametric

The choice of parametric or non-parametric and the specific statistical test to use are determined by several assumptions, criteria and the research question. There are differing criteria, advantages and disadvantages to the use of parametric or non-parametric tests for a study. Parametric statistical test, unlike non-parametrical test, assume certain defining characteristics of the population distribution(s) from which the research data is obtained. One assumption is that there is an underlying normal (bell-shaped) distribution of the population which is often drawn through means of samples (Motulsky, 1995). The parametric test is typically employed when the data measurement is ratio or interval and the variance of the variables are homogenous or equal (Conover, 1980, Bryman and Cramer,

1994). The non-parametric tests do not make assumptions about the parameters or precise distribution of the population (Bryman and Cramer, 1994). Typically, the non-parametric test is used more with nominal and ordinal scales of (rank order) measurements (Conover, 1980). Less commonly, non-parametric test could also be used instead of a parametric test with the interval or ratio scale of measurement in a number of cases. These cases include situations in which normality of the underlying population distribution are not met; the distribution function of the random variable producing the data is either specified; or there are a number of unknown parameters (Conover, 1980; Siegel and Castellan, 1988).

The decision to use one over the other is taken with respect to the sample size, shape or distribution of the underlying population assumption, level and scale of measurement, and outliers. There are advantages and disadvantages with both types of statistical test analysis as listed in table 5.7.

Table 5.7

Parametric and Non-Parametric Statistical Tests: Advantages and Disadvantages

Statistical Test	Advantages	Disadvantages
Parametric	more flexible	make more assumptions
	allow greater range of hypotheses to test	more complex to compute
	more efficient- data permitting - use more of the information available of data	not used with very small samples (difficult to assess normality)
	Less Information wasted	less suited with discrete non-continuous scales (nominal or ordinal); since intervals between the ratings may not be equal
Non-Parametric	make fewer assumptions	may Waste Information (lacks precision)
	used with all scales	lower power
	rely less on the population distribution	mainly testing distribution
	population parameters is not required	higher ordered interactions not dealt with
	easier to compute and results may be exact as parametric procedures	large Samples are not as easily computed without use of software
	Small sample size	
	less affected by outlier data	

Source Author: adapted from literature review of Conover, 1980; Knoke and Bohrnstedt, 1994; Sheskin, 2007; Siegel, 1957; Zimmerman, 1994

The specific type of test statistics chosen is determined by the characteristic of the data (Corder and Foreman, 2009). The awareness and understanding of the advantages and disadvantages of the statistical test help to direct the eventual decision of the data analysis.

5.10.3 Use of Non-Parametric Statistical Tests in the Study

The data in the study could be analysed either by parametric or non-parametric test. A case could be made to use either of the statistical methods. The data analysis in the study was done using non-parametric tests for several reasons. As discussed in the previous section 5.10.2, there are advantages and disadvantages associated with both methods. The study uses the non-parametric statistical data analysis test because of the advantages, as discussed in section 5.10.2.

There are four specific reasons why a non-parametric test was used. First, the study uses mix of large and small sample sizes of participants with management training and those without management training. This was an advantage, since the non-parametric tests require fewer assumptions about the shape or distribution of the underlying population and work with small sample sizes. Although, the non-parametric tests use less information (ordinal or ranking information only) which can be a disadvantage in that it limits their power with to inferential analysis (i.e., no regression analysis) (Siegel and Castellan, 1988). The use of techniques that require less information can also be an advantage because they are less demanding of the data. Second, the study uses ordinal scale of measurements. This is another advantage because the non-parametric tests are suited for non-numerical ordinal responses. Third advantage is the non-parametric test and the minimal affect with outliers (Siegel, 1956, Zimmerman 1994). The outliers, discussed in more detail in chapter 7 (section 7.7.2), are extreme values that stand apart from the distribution (Knoke and Bohrnstedt, 1994). Finally, the study is not testing multiple hypotheses and the power of test is reliable for the purpose of single hypothesis test. The detailed data analysis method and technique used in the study is also discussed in detail in the chapter 7.

There are a number of both parametric and non-parametric tests available for a study. Some of the common statistical tests are listed in table 5.8. Each test is used under varying conditions depending on the hypothesis to be tested and the research question.

Table 5.8

Common Parametric and Non-Parametric Statistical Tests

	Examples of Common Test	
Type of Test	**Parametric**	**Non-Parametric**
Common level of measurement	Interval or Ratio	Ordinal or Rank (rating)
Two Sample (compare mean value) or difference between independent sample groups	t-test between sample groups	Mann Whitney U
Paired sample within group test	Paired t-test	Wilcoxon Rank
Multiple (Three or more) Sample Groups	Analysis of Variance (ANOVA)	Kruskal Wallis
Correlation (Degree of association)	Pearson correlation of coefficient	Spearman Rank correlation coefficient (proportion of variability)
		Kendal Tau correlation coefficient (measurement of association, looking at difference between probability)

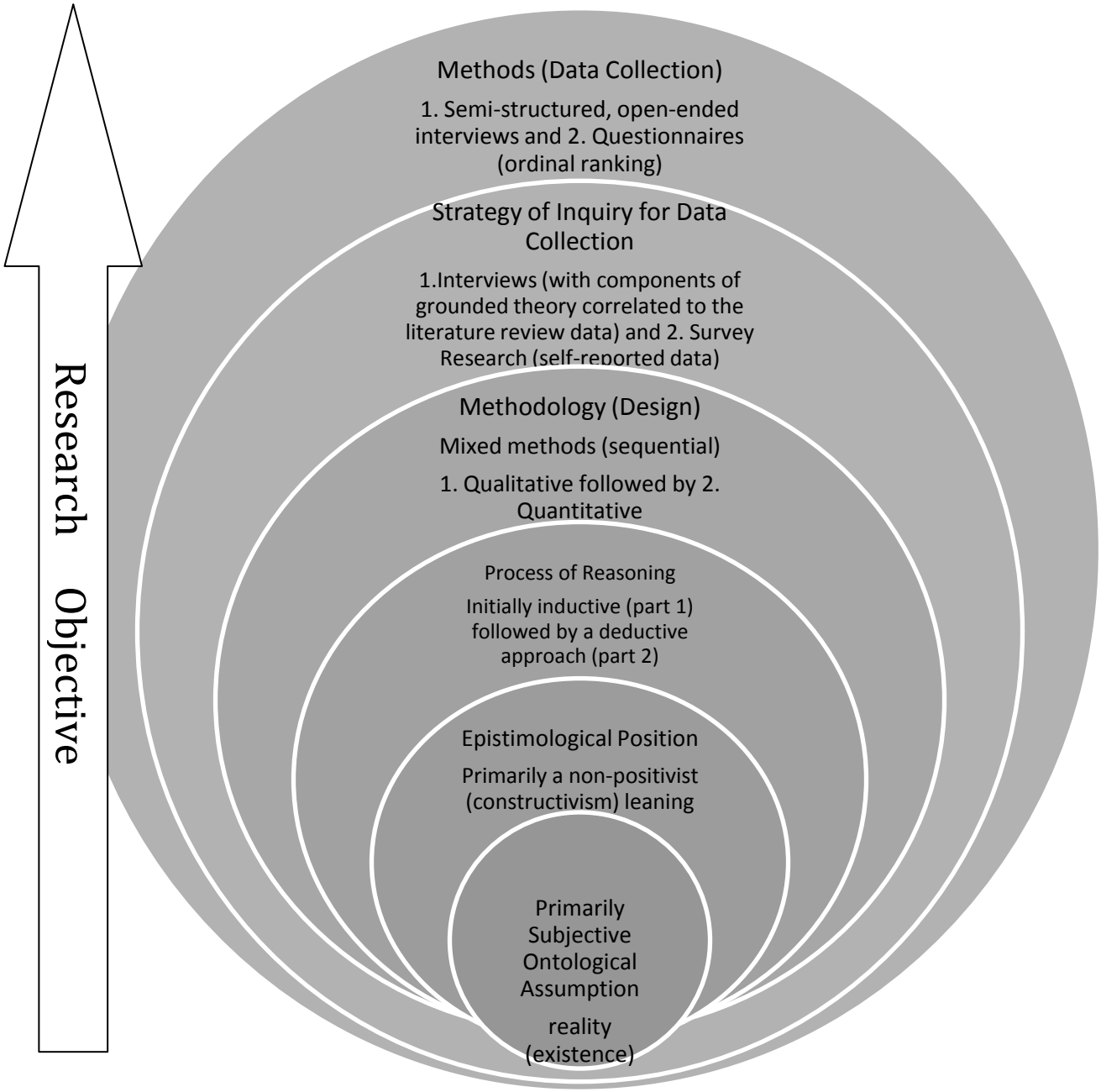
Source Author: adapted from literature review of Sheskin, 2007; Siegel & Castellan, 1988; Conover, 1980; Siegel, 1957; Zimmerman, 1994

The specific test chosen for the study was based on the appropriateness of the sample characteristic and the type and level of measurement used. The study hypothesis test consisted of two sample tested in each clinical and management category of tasks. First test, the Mann Whitney U non-parametric is a statistical test used appropriately with ordinal two independent samples. The second test chosen was the Kendall Tau correlation coefficient test which measures the association between the sample data variables. These specific non-parametric tests and results are discussed in more detail in chapter 7, section 7.8.

5.11 Summary Illustration of Assumptions and Methodological Approaches for Present Inquiry

Figure 4 outlines the assumptions and methodological strategies and techniques discussed in detail in this chapter. The primary assumptions and stances taken for this dissertation on reality, knowledge and reasoning—along with the specific method strategies and techniques used in the inquiry—are illustrated in figure 4. These stances are viewed as tending towards the subjective dimension along a scale or range of subjectivity-objectivity, as illustrated on table 6.6 of the Burrell and Morgan, (1979) framework. This framework views the assumptions in relative terms rather than on an absolute point at one end or the other of the spectrum. The ontological assumption is primarily subjective in nature, taking a relativist rather than an absolute stance on reality. The epistemological position is primarily non-positivist in nature, taking a constructivist, philosophical view on knowledge and the acquisition of it. The primary reasoning used in the exploratory phase of the research was inductive. The primary reasoning used in the longer survey study was deductive, framing the second part of the sequential mixed-methods design. The mixed methods design began with an initial qualitative phase followed by a quantitative phase. The specific strategy of inquiry of the exploratory study involved semi-structured, open-ended interviews. The data collection strategy in the exploratory study involved aspects of the grounded theory in which the interview data was first coded and categorized. This coded data was then augmented and correlated with the input from the literature review. The questionnaire for the quantitative phase of the research was developed from the coded and categorized data findings of the exploratory study. The questionnaire used an ordinal ranking scale for the self-ranking by medical professionals (physicians). This data was collected and analysed statistically and then presented on tables and charted graphically.

Figure 5.2 Research Design Framework of the Study



Source: Author adapted from literatuire review (Babbie and Benaquisto, 2002; Creswell, 2003; Crotty, 1988; Gubba and Lincoln 1994; Tashakkori and Teddlie, 1998)

In summary with the research design and methodology approach of the study outlined, the next two chapters present and discuss the implementation of the strategy chosen for this study. The focus of the next chapter is the pre-requisite creation of the survey with the use of a pilot study. This is followed by a detail analysis of the results of the questionnaire in chapter 7.

Chapter 6

Development of the Survey Process and Results

6.1 Introduction

The purpose of this chapter is to present and discuss the process and steps involved in the development of the survey used in the main study. As previously discussed in the methodology chapter 5, section 5.7, a pilot study was carried using a qualitative approach in order to inform the design of a quantitative survey instrument for use in the main study. The results from the pilot study are presented in this chapter. Once created, the survey was used to test the self-reported individual-level competency and confidence of medical professionals. The initial pilot study was a necessary precursor to the development of the survey used in the main study. As also previously discussed in section 5.9 of chapter 5 the pilot study took a qualitative approach. This was the initial part of an overall mixed-methods approach to obtaining data through the use of semi-structured, in-depth interviews with medical professionals. The empirical data collected from the in-depth interviews were used to create the clinical and management task categories used in the development of the survey.

The chapter is organized in seven sections. The first section discusses the requirements and development of the pilot study in the creation of the survey for the study. The second section presents the qualitative semi-structured in-depth interview approach of the pilot study. The guideline for carrying out semi-structured open-ended interviews is discussed in this section. Third, the chapter presents the empirical data collected from the interviews. Fourth, it outlines the strategy for the organization, coding and categorization of the empirical data. Fifth, it illustrates how the organized data are used to generate clinical and management task categories. Sixth, it correlates and supports the empirical choices of categories created from the interview data with findings from the literature review (see appendix tables 9, 9.1 and 9.2). Finally, seventh, the completed survey

with the clinical and management task categories developed for the main study is presented.

6.2 Development of the Pilot Study Interviews

As discussed in chapter 5.8, a semi-structured interview with open-ended questions was developed and conducted (Section 6.3). The conversation with the interviewees was fluid, with the answers to the initial questions shaping the subsequent questions. This method of probing into previous answers allows redirection when the interview appears to be going off path (Babbie, 2001). The interview questions were derived from concepts associated with the research interest and aims. The broad interest in confidence and competency in clinical and management tasks was the guide to gain information on specific variables and categories of clinical and management tasks in association with training.

6.3 Pilot Interview Questionnaire

The interview questionnaire served two purposes. The first purpose was to obtain personal and descriptive information on the subjects. The second purpose was to allow open ended responses to gather in-depth information for the focus of the survey and to development of the depended variable task categories. The semi-structured questions in the pilot interviews represent a guideline and a plan of inquiry, but not necessarily a sequential or ordered path. The questionnaire began with a set of initial introductory questions, followed by a set of probing and follow-up questions.

The example questions used for the pilot interview were:

1. What is your name?
2. How old are you?
3. Where did you go to school?
4. What is the level of your education?
5. What specialty are you practicing?
6. How many years have you been practicing?
7. Where do you work?
8. How large is the facility you work in?
9. How many staff members are working with you?

Guide for Initial Questions with Some Probes and Follow-Up Questions

1. Can you describe your experience in taking on management roles, duties, or tasks?
    - How do you feel about taking on management tasks or duties?
2. What does confidence mean to you?
    - Can you describe your confidence with respect to clinical tasks?
    - Can you describe your confidence with respect to management tasks?
3. What does being competent mean to you?
    - Can you talk about what it is to be competent in your clinical side vs. the management tasks your responsible for?
4. How do you feel a medical professional can become competent?
5. How do you feel a medical professional can become competent in the medical and management tasks?
    - What if any differences or changes do you see, explain?
6. What role do you feel experience has played in becoming competent with respect to management tasks and decisions?

7. Can you describe your confidence with respect to experience in dealing with management tasks and decisions?

8. Can you describe any further training or education in the management field you have taken or will take?

    - If yes, what training and education….describe what it has meant for you…..and how has it helped or hindered you?

    - If not, do you feel it is a good idea…would you take further training and education if it was made available?

6.4 Interview Participant Sample

The pilot study began with five 45 minute in-depth semi-structured open-ended interviews with the research subjects. The subjects were a small sample (5) of mid-career medical staff (physicians/managers) in the Greater Toronto area of the province of Ontario in Canada (Table 6.1). The participants were from various specialties and from either or both a hospital or a private practice facility. This helped ensure that a broad range of settings and views were represented in the exploratory phase of the research during which categories and variables were developed for the broader and more extensive questionnaire survey for the main study. The intention with the pilot interviews was to help identify broad categories of managerial and clinical task which would be applicable across a range of healthcare settings and specialties thus helping widen the respondent pool for a larger survey study.

Table 6.1

Research Subjects

Participants	Age	Practice Specialty	Practice Facility
1	42	Emergency Medicine	Hospital
2	41	Cardiologist	Hospital and Private Centre
3	44	Family Medicine	Private Centre
4	41	Cardiologist	Hospital
5	40	Gastroenterologist	Hospital and Private Centre

The mid-career medical professionals were interviewed (Table 6.1) between November and January 2009. The interviews took place in either the medical professional's office or at his or her residence at the end of the working day. As previously stated, in 5.7 above, Strauss and Corbin's (1990) approach to qualitative data analysis was adopted for the pilot study. The aim was not to generate a theory but only to employ the data analysis techniques of coding and category emergence used in the grounded theory approach. The small sample used in the pilot study provided a large amount of in-depth data that were used to create clinical and management categories for the main study survey. Once the clinical and management categories emerged from the small sample as guided by Strauss and Corbin's (1990) interpretation of data analysis from the interview data, the categories were subsequently correlated with an extensive literature review. Since the study used in-depth data from a small sample, a literature review was also performed on the clinical and management concepts and categories. The literature review was used to verify the focus and direction of the survey considering the clinical and management fields and the aim of the study. The literature was not used to change the categories that emerged from the interview data.

6.5 Interview Data and Analysis

Transcripts of the interviews were made for each subject. The interview data were analysed and coded using the techniques of qualitative data analysis as outlined by Strauss and Corbin's (1990) grounded theory approach. The transcripts were analysed in accordance with the constant correlation technique of organizing and categorizing similar terms. Four sets of clinical and management categories emerged from the interview data as listed in table 6.2. This also included the emergence of a fifth management, primarily numerical, category (finance).

Table 6.2
Emergent Clinical and Management Task Categories from the Interviews

Clinical Tasks Categories	Management Tasks Categories
1. Patient Examination	1. Strategic Leadership
2. Patient –Treatment	2. Strategy (management)
3. Continuing Education	3. Organizational Process
4. Clinical Records	4. Human resource management
	5. Finance and budgeting* Additional numerical quantitative management task

These sets of clinical and management categories and their concepts and terms as extracted from the transcripts are presented. These concepts and terms were coded and organized into sets of tasks through constant comparison. Four sets (non-numerical) of each clinical (Table 6.3) and management task (Table 6.4) and an additional numerical (finance) management task (Table 6.4.1) were created from the in-depth analysis. In developing the emergent clinical categories word or string of words were grouped through constant comparison of their meaning and relationship to each other with respect to a task. For example, words and phrases such as diagnosis, triage, primary care, doing rounds and diagnostic test are all related to patient examination task category. The constant comparison method of grouping words and phrases from all the interviews was done on the basis of their

relationship to each other, similarity in broader duty, and similarity of focus. The same procedure was followed for the other emergent categories in each Table 6.3, 6.4 and 6.4.1.

Table 6.3

Emergent Clinical Categories

Patient Examination	**Patient Treatment**	**Continuing Education**	**Clinical Records**
Diagnosis	Bedside care	Continuing medical education	Record keeping
Triage	People skill	Bringing education (learning) into practice	IT Skills
Primary care	Patient care	Medical education program	Utilize data
Reduce unnecessary admissions	Looking after patients	IT skills	Communication (Chart for Staff)
Reduce unnecessary investigations	Patient advocate	Sharing ideas (experience)	Be aware of patient issues
Creating better patient encounter	Patient centric care	Staff education	Be aware of technical issues
Doing rounds	Medical legal	Attend Meetings	Carrying forth (implementing)
Diagnostic procedures	Quality patient care	Take Courses	Understanding patients
Diagnostic test	Engage people	Do studies on patient	Patient communication
Utilize data	Clinical excellence	Clinical investigation	Carry out tasks (treatment)

Do studies on patient (diagnosis)	Manage to standard of care	Attend healthcare conferences (workshops/seminars)	(Clinically) organized
Admissions task	Manage patient	Clinical meetings (discussions)	Delegate tasks (staff)
Talk to patients	Reduce incidence of disease	Be aware of patient issues	Prioritize (task)
Listen to patients	Increase number of procedures	Be aware of technical issues	Evaluation
Clinical investigation	Create the right environment	Take clinical courses	
Interpret test	Aim towards end product satisfaction	Learn clinically by experience (mistakes)	
Clinical investigation	Create best clinical experience	Public speaking	
See patients effectively	Help people	Attend clinical lectures	
Role reversal	General care for all patients (group)	Share insights (with other staff/clinicians)	
Reading patients	Individual care of patient	Taking clinical courses (CE)	
Understanding patients	Quality care for patients	Learn from books	
Patient communication	Correct clinical process		
Prioritize (task)	Appropriate treatment		
Evaluation	Treatment in timely fashion		

	Do no harm		
	Reduce patient risk		
	Patient follow-up		
	Manage out patients		
	Follow the correct course of action		
	(Advocate) patient's best interest		
	Empathizing		
	(Employing good) Bedside manners		
	Healing individuals		
	Prioritize (task)		
	Evaluation		
	Bring in consultant		

Similar to the procedure followed for the development of the emergent clinical categories, the emergent management categories word or string of words were grouped through constant comparison of their meaning and relationship to each other with respect to specific management task. For example, words and phrases such as planning work, recruiting strategy, working towards, evaluate, prioritize and reprioritize and grand vision are all related to the strategy task category. Much like the clinical emergent categorization, the constant comparison method of grouping words and phrases from all the interviews was also done on the basis of their relationship to each other, similarity in broader duty, and similarity of focus for management tasks. The same procedure was followed for the other emergent management categories in Table 6.4.

Table 6.4

Emergent Management Categories

Strategic Leadership	Strategy (Management)	Organizational Process	Human Resource
Vision	Planning work	Trade off	Networking
See the big picture	the year doing all this planning	Organizing	People skills
Setting goals	vision…master plan	Set-up	Advocate for people
Develop game plan	working towards	Putting together	Interpersonal skills
Develop answers	Planning	Time management	People (human) interaction
Bridging gaps	create a framework and a groundwork	Keeping a balance	Attract people
lose track of the big picture	Choose, Commitment	Staffing (Delegating/responsibilities")	Developing rapport
(Looking at the) big picture	evaluate, prioritize and reprioritize	Setting ("multiple goals")	Engaging people (staff)
Prioritizing	Get things done	Creativity, framework/ groundwork	Putting together team
Leading (Leadership) skills	recruiting strategy	Record keeping	Managing staff
(Seeing the) Big picture	Put together	Focusing	Staffing
Advocate	Vision is grand	Prioritizing	Hiring

Bringing (those) into	focusing this stage of my life	Tracking	Retaining staff
Engage	To act, pursue other interests		Providing the right environment
Influencing people	Decision making		Delegating (duties/work/responsibilities)
Getting team on board	Carry out (forth)		Evaluating performance
	Invest (future)		Staff feedback (concerns)
			Influencing people
			Getting team onboard
			Setting up committees/focus groups
			Relationship building
			Communication skills
			Teaching skills

Table 6.4.1

Emergent (Numerical Task) Management Category

Financing			
Budget	Resource allocation	Balancing the books	Bottom line
Money (management)	Cost (management)	Profit (management)	Spending
Figures	Capital	Accounting	Funding

6.6 Role of Literature in Clinical and Management Categories

The literature review commenced following the employment of grounded theory in the pilot study. This enabled the development of clinical and management categories (tables 6.3, 6.4, 6.4.1). The study acknowledges that this method was not advocated by the purist stance of the data analysis for grounded theory (Glaser, 1978, 1992). As previously discussed in chapter 6, section 6.6, the literature on the concepts was used to verify the focus of the categories after they emerged from the interview data. This study is more in agreement with scholars who take a less purist stance (e.g., Straus & Corbin, 1990; Urguhart, 2001; Bryant, 2002). The pilot study does not completely ignore the literature but uses it to verify the logic and direction of using the emergent categories. Sections 6.7 (sub-sections 6.7.1, 6.7.2, 6.7.3, 6.7.4) and 6.8 (sub-sections 6.8.1, 6.8.2, 6.8.3, 6.8.4) are a discussion of the importance of each clinical and management task category as it applies to the medical professionals in the health-care sector.

6.7 Clinical Task Categories' Literature Review

The clinical task categories identified through coding of the pilot interviews (namely patient examination, patient treatment, and continuing education and patient records) were then subjected to a separate literature review to understand

the context(s) in which these tasks took place. The detailed literature review examination of each clinical category is outlined in appendix 9.1.

6.7.1 Patient Examination

The literature review on the clinical tasks involved in the examination and treatment of patients was derived from the medical training and health-care literature. This combined-step approach as developed in the research design and methodology chapter (sections 5.7, 5.8) was used to support and correlate the empirical findings in the formation of the categorized list of clinical tasks. In the literature, a common approach in examination and diagnosis is the RCA, or root cause analysis, in which the problem is defined; evidence is gathered and analysed; the root cause is established; and a solution is recommended followed by implementation (Marco et al., 2006). These are all important steps in the personal interaction with patients and the use of technology and diagnostic tools.

6.7.2 Patient Treatment

The core of caring for and treating patients once the examination and diagnosis have been completed involves carrying out the recommendations. The types of treatment and care may be in the form of one or more of the following: medicine, radiation, psychological treatment, surgical procedure or no treatment. These all involve competencies on the intellectual, technical and procedural levels. As previously discussed chapter in 4, a competitive advantage is gained from the human (embedded individual tacit and explicit knowledge) and social (embedded knowledge in routines and relationships) capital (Nelson and Winter, 1982; Starbuck, 1992; Wright et al., 1994; Alvesson, 2001). The experiential and tacit knowledge along with the explicit knowledge play an important part in the physician's biomedical training. The opportunity to make a difference in the lives of others was cited as an overwhelming reason for first-year medical students (90% in the 2005 AAMC Survey) to choose a career in medicine (Nash et al., 2006). This is the advocacy and empathy that are hoped to be carried throughout one's career. One of the important aspects of improving clinical effectiveness through training

and evidence-based assessment is tied to whether the appropriate qualification skills are present in the areas of focus (Haines et al., 1996). This, points out the constant need to improve the standard of care with respect to competencies in treatment possibilities and outcomes. There are ongoing debates about clinical performance and standard guidelines as performance measurements for differing premises of methodology and philosophy (Hurwitz, 2006). These are all a focus for improvement in the treatment and care of patients with the goal of achieving beneficial and acceptable standards.

6.7.3 Continuing Education

The important aspects of continuing education courses and the awareness and incorporation of new research findings are essential to the medical profession. Graduation from medical school is the "beginning of a lifelong process of acquisition of knowledge and skills" (Piterman, 1999: p. 108). The evidence-based approach to practicing medicine, which requires constant continued learning, was placed in the top 15 greatest contributions to medicine in 150 years by the British Medical Association. The improvement in the quality of medical care has been linked directly to the speed of incorporating the principles of evidence-based medicine and the monitoring of quality and improvement into all levels of the clinical curriculum (Goldfarb, 2006).

6.7.4 Record Keeping and Charting

For medical professionals, record keeping and charting is a time-consuming but critical task. They are used to document all the encounters with patients and the diagnosis and treatment given. They are also a medium of communication with others – nurses, technicians and colleagues – about the history and ongoing treatment and care of a patient. There are important medical legal issues associated with these in terms of various acts pertaining to data protection, access to medical records and access to personal files (Strawford, 1996: pp. 297-299). These all make it mandatory legally but also to achieve quality patient care and safety to be comprehensive and complete in charting and keeping good records.

Technology is also important in the advent of computerized records, for which some IT skills are required. IT assessment and training are essential in system support for patient management flow and other financial data records and retrieval (Nelson, 2005: pp. 149-153).

6.8 Management Task Categories' Literature Review

In a similar process to that described for clinical tasks, those managerial task categories identified in the coding of the pilot interviews (namely strategic leadership, strategic management, organizational Process, human resources, and finance and budgeting) were subjected to a second review of the relevant managerial literatures though this involved revisiting elements of the RBV and more general strategic management literatures examined in the main literature review of the thesis. The detailed literature review examination of each management category is outlined in appendix 9.2.

6.8.1 Strategic Leadership

The importance of medical professionals' leadership is observed by the value achieved through the direction and guidance to the followers or support players. Scholars (Porter & Teisberg, 2006) have identified that the individual physicians are main actors and the place where most value is actually delivered in the health care system. The other factors in the system such as health plans, employers, suppliers, government or patients themselves are viewed as re-enforcers or detractors from this value through their actions and choices made. The importance of vision, setting realistic goals and leading by example are important attributes for leadership. Leadership attributes include having "guiding vision", seeing "the long view", "knowing yourself" and inspiring trust before people can follow you (Bennis, 2003: pp. 31-47, 186).

6.8.2 Strategy (Management)

Strategy may be defined as “the current set of plans, decisions, and objectives that have been adopted to achieve the organization’s goal” (Daft, 2007: p. 599). The strategic management related to the tasks in an organization include “three ongoing processes: analysis, decisions, and actions” (Dess et al., 2005: p. 9). The concept of strategy, as discussed in detail in chapter 2 (section 2.7 to 2.11), has been used in various fields and disciplines. The importance of long-term planning, making decisions and implementing those plans and decisions are key attributes of strategic tasks. The tasks of strategy are examined in the broader concepts related to planning, long term vision and aim, prioritizing long term, and adopting paths towards a goal.

6.8.3 Organizational Process

Organizational process and capabilities as discussed in chapter 3 (section 3.11) are viewed at a macro level as opposed to the operational capabilities, which are viewed at a micro-level (Teece et al., 1997). The competencies, such as innovation, flexibility and the development of excellence in service that a firm uses to change the inputs into outputs are its organizational capabilities (Dess et al., 2005). The organizational capital within the RBV is seen as features of multiple or groups of individuals in which the planning and control, synchronization, culture and reputation are interlinked and woven with group relations dynamics internal and external to the firm (Tomer, 1987; Barney, 1997). These differ from the individual capabilities in exploiting resources. Organizational capital as outlined in chapter 3 and 4 (table 3.1; section 4.4 and appendix 9.2) refers to competencies of the firm’s culture, planning and coordination with respect to innovation, creativity, flexibility and leveraging of the tangible and intangible resources (Barney, 1997; Dess et al., 2005).

6.8.4 Human Resource Management

The specific features of human resource management consist of activities which include tasks such as training, development, recruiting, hiring and compensation of workers (Porter, 1985). The importance of human capital in the RBV as discussed in Chapter 1, sections 1.0 and 1.4, is important for gaining competitive advantage for a firm. These components of managing people and relationships are important aspects of competition and superior performance, whether they generate rent, quality or societal benefits. Becker (1964) included components of "training, experience, judgment, intelligence, relationships, and insights of individual managers and workers in a firm" as important parts of the human capital resource (Barney, 1997: p. 143). The tasks for the development of this category include these component and related concepts.

6.8.5 Finance

The important aspects of financial capital in the RBV include all the various monetary resources that firms or organization can use to develop and execute strategies (Barney, 1997). This alludes to the importance of having knowledge and being aware of the money and capital to enhance the capabilities and competency for this important resource. The important aspects of budgeting and financing activities are pointed out in that "our income determines the amount we can afford ... the standards we can aspire to … and the difficult choices about what we can and cannot have, and what we can and cannot do" (White, 1996: p. 212). As previously discussed in chapter 1, section 1.5, In the era of competition and government and health insurance coverage, the importance of reducing cost and increasing net benefit is important with respect to patient's ability to choose the type of care they receive, as well as the physician's freedom to choose the amount and type of care given to patients (Porter & Teisberg, 2006).

6.9 Survey

Once a set of clinical and management categories had been confirmed from the pilot study and subsequent literature review, they were divided further in order to formulate three to five questions for each task. The resulting survey was made up of questions asking the medical professionals to rate their self-reported competency and confidence on both the clinical and management tasks. As previously discussed in the methodology section 5.13, the ratings were scored on a 5-point likert scale (1 – very low, 2 – low, 3 – neutral, 4 – high and 5 –very high). The emergent clinical and management task categories are summarized in table 6.5.

Table 6.5

Division of the Clinical and Management Task Categories

Clinical Tasks	**Management Tasks**
1. Patient Exam	**1. Strategic Leadership**
A. Evaluating patient symptoms	A. Setting out a vision
B. Use of diagnostic tests for patients	B. Setting goals
C. Evaluating clinical test results	C. Setting an example for others
2. Patient Treatment	**2. Strategy management**
A. Communication abilities with patients	A. Long term planning
B. Clinical treatments for patients	B. Implementing planned strategies
C. Patient advocacy	C. Decision making
D. Teamwork with staff	
3. Continuing Education	**3. Organizational Process**
A. Amount of continuing education courses	A. Organizational Creativity
B. Level of continuing courses	B. Organizational Flexibility
C. Keeping up-to-date with current clinical literature	C. Efficient use of resources
D. Keeping up-to-date with current clinical conferences	D. Organizational Innovation

E. Incorporating new research findings into practice	
4. Clinical Records	**4. Human Resource Management**
A. Keeping good patient records	A. Recruiting Staffing
B. Quality of charting	B. Retaining Staff
C. Information technology	C. Building teams
	D. Training staff
	5. Finance / Budgeting
	A. Managing money
	B. Control of capital
	C. Creation of budgets

Securing responses from a particularly busy population of clinicians in the Canadian healthcare system was expected to be challenging. Clinicians are subject to ongoing, multiple requests for participation from many other research organizations (e.g., pharmaceutical and medical device companies, other clinicians, NGOs, government organizations and medical associations). Many of these other requests for research participation are heavily incentivized by the research sponsors. Hence, to maximize future research potential, the eventual survey instrument contained other qualitative and quantitative questions which were not central to the research question addressed solely in this thesis. These additional items will feature in separate publication activity beyond the completion of this thesis. The complete survey can be viewed in figure 5.1.

6.10 Survey Distribution and Implementation

The distribution and implementation of the survey as discussed in chapter 4 began with a search for the contact information of medical professionals (physicians) across Canada. Multiple possible methods of finding public information from telephone directories, professional directories, Internet source listings and open-source database listings were used to gather and create an email contact resource. An initial introductory invitation letter was sent out and also placed at the

beginning of the survey. In the screening process to find members of a population, the screened units are not part of the response rate (Fowler, 2009). Out of a list of 11,261 possible physicians, 5,631 physicians were contacted. Hence, the remaining screened physicians from the list who were not contacted for several reasons; such as, email filters, closed email accounts, retirement, relocation and practice closure. They were not considered in the response rate.

The survey involved only a sample or proportion of the medical professional population under study. The sample size was determined by several practical considerations, such as cost, response rate and level of (sub-group) analysis required by the researcher (Gray & Guppy, 1999). The precise statistical calculations for the sample size can be theoretically obtained but are difficult in practice due to cost, sub-group analysis and multi-causal survey design (Fowler, 1993; Gray & Guppy, 1999). The relatively large sample size and high response rate (352) of those physicians who participated was a welcome observation due to the challenges related to physician surveys. The challenges of obtaining a large sample size and a high response rate are more pronounced with a population of physicians because of their reluctance due to their opportunity costs, many more requests to participate in surveys and their gatekeepers (secretaries/front office staff) (Flanigan et al., 2008). There is a 10 percentage point decrease observed on average in the physician response rates for mail surveys over the general population (Cummings et al., 2001). This reluctance and these lower response rates have been reported in other studies involving elite populations, much like those seen in physician surveys (Sudman, 1985; Flanigan et al., 2008).

The survey was loaded onto the Survey Monkey Internet service for the participants to log onto. The survey was made accessible to the physician participants for a period of just over 5 months, from 20 June 2010 to 22 November 2010. The web-based survey was chosen for the based on the following advantages: reduced cost, the ease of taking the survey, flexibility of location for taking the survey and the greater efficiency of data collection and analysis. First, the use of online surveys and tools allowed for the reduction of costs due to there being no need for paper, office supplies, printing, telephone, mailing and travel. Second, the participants

were sent the web address of the Internet survey site, which could be accessed according to their own schedule and time availability. Third, the survey was Internet-based, and therefore could be taken conveniently anywhere where there was a computer and Internet connection, at home or at the office. Finally, the data were collected in a digital format that could be transferred to a spreadsheet for efficient and effective analysis using the Statistical Package for the Social Sciences (SPSS).

SSP internet lock security was used and strict confidentiality was maintained. Regarding the response rate, approximately 7.0% (395 physicians) logged onto the site, of which 6.3% (352 physicians) completed all or part of the survey. The response rate for those who logged onto the Internet survey site and completed all or part of the survey was 89.1% (see the summary in table 6.6). No monetary incentives were given to the participants. The medical professionals were asked to participate on the merits of the research and the contribution to knowledge development. The implementation of the survey began with the sending of initial introductory email letters (see appendix 9.4) regarding the study, contacts, maintenance of ethical standards and consent with all the questionnaires. The physicians logged onto the Internet service to complete the survey. The personal instructions given and responses obtained were as follows:

Table 6.6 Canadian Medical Professionals' (Physicians') Personal Information

Instruction to participants:
Please fill out: Note: Your responses will not be identified with you personally.
Name and identification will be given a number or code to maintain anonymity. (strict confidentiality will be maintained at all times)

Answer Options	Response Percent	Response Count
Name	99.1%	349
Age	98.0%	345
Specialty	99.7%	351
Medical School	99.4%	350
Practice Type (e.g., private, hospital, military, government)	99.7%	351
Years in Practice	98.9%	348
answered question		352
skipped question		41

In the next chapter (7) the focus shifts to the results obtained from the use of the developed questionnaire. The study presents the results of the survey in chapter 7. In addition, the chapter discusses the inferential statistical analysis and the final descriptive tabled and graphed results.

Chapter 7

Questionnaire Results

7.1 Introduction

The survey developed from the pilot study was used in the main study to question medical professionals on their perceived competency and confidence regarding clinical and management task categories. As discussed in chapter 5 (section 5.6), a mixed-methods approach was followed for this study. A prerequisite qualitative approach in the pilot study was taken in the development of the survey for the main study. The primarily quantitative survey created in the pilot study was used to measure the self-reported ratings of self-perceived confidence and competency regarding clinical and management tasks in the main study. This was a quantitative investigation of embedding competency and confidence in human capital. The purpose of chapter 7 is to present, analyse and discuss the findings of the survey developed from the pilot study. The study results from the self-reported data collected from the survey questionnaire are presented first in a chart format. Second, the results are also plotted in graphs, in order to enable a visual comparison between the various types of management training and groups that had received management training (the yes group) and those that had not received management training (the no group). This chapter presents the data collected from the on-line survey in which there were 352 participants. The quantitative data results from the survey were collected, correlated and statistically analysed in an attempt to answer the central research questions as set out in chapter 1 (section 1.3.1). The data results were obtained from the self-reported individual-level perspective. The key area of focus of the quantitative survey results was the examination of the different methods of training of medical professionals and their effect on the embedding of competency and confidence in the human capital resources.

As discussed in chapter 3, section 3.13, in the RBV literature the organizational competency contribution by authors (e.g., Barney, 1991; Prahalad & Hamel, 2001)

focuses on the aggregate of human capital in a firm. The primary focus of the study is on the embedding of individual-level competency through training. The results from the concept of confidence offer additional support to the competency results in the embedding process of human capital toward building resources. Therefore, the chapter is organized and divided as follows: first, the method of distribution and implementation of the survey developed through the pilot study is outlined and examined; second, the training and management education that are embedded are highlighted and discussed; third, the competency self-reported data collected are presented and analysed; fourth, the statistically significant correlation results for competency in seven management tasks of the groups with (yes group) or without (no group) management training are examined, analysed and illustrated graphically; and fifth and finally, the results for the concept of competency on an additional, primarily numerical task of finance are presented and discussed.

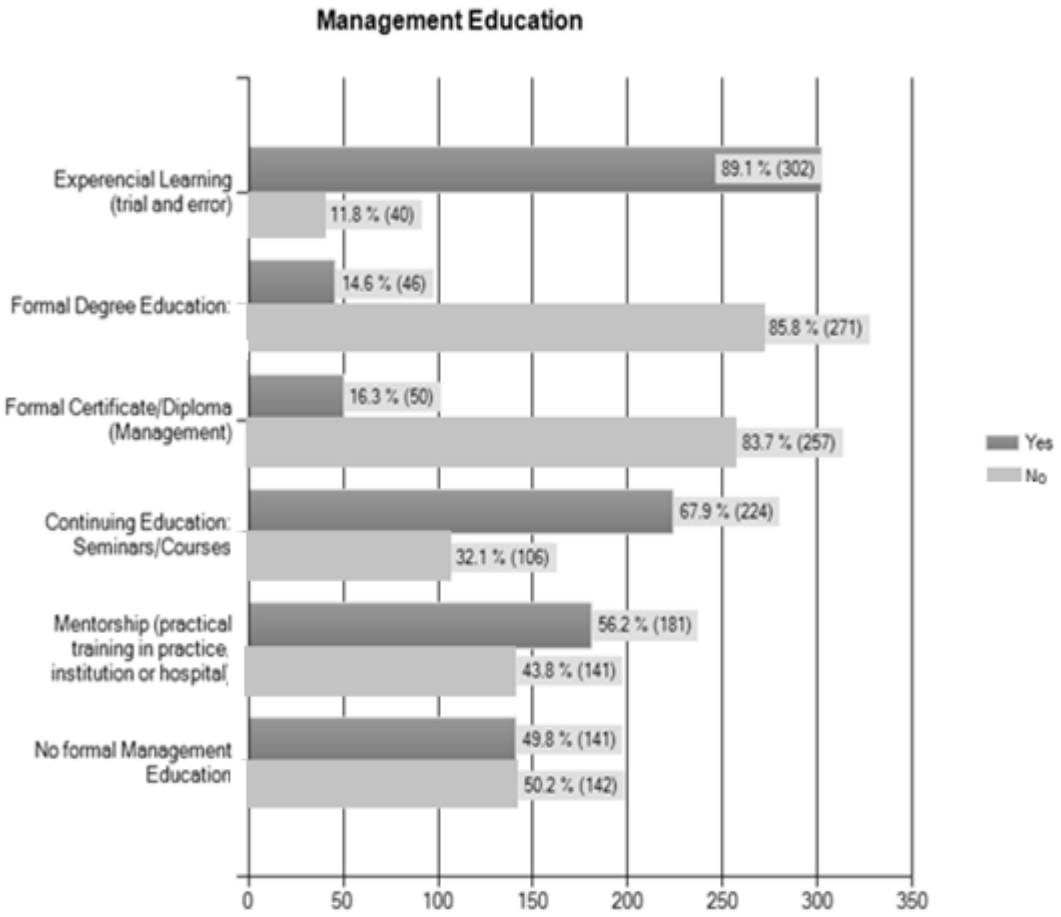
7.2 Management Education Acquired Results

The results from the survey questionnaire were collected and tabulated in a spreadsheet. The following sections of this chapter present the quantitative data in bar graphs. This data result on the bar graph gives the number and percentage of physicians who indicated that they either had management training (the yes group) or they did not have management training (the no group) for each type of training format. The medical professionals were first asked if they had acquired a certain type of formal management training or education. The categories were: formal university degree, formal certificate or diploma, continuing education or seminar courses, and mentorship training. These were formal courses or hands-on training and education methods from instructors or institutions. Two other non-specific categories were also included to gauge the responses from another general non-training and education perspective in the form of learning from experience and by rewording the question to no management education. The results indicated (see chart 6.0) that a minority of physicians in terms of percentage had formal degrees (14.6%) or certificates/diplomas (16.3%) in management training or education. This was in contrast to the majority of physicians, who indicated that they had taken

continuing education seminar/courses (67.9%) and mentorship training (56.2%) in management. The vast number indicated that they had learned management from their experiences (89.1). The question that asked whether they had no management education was answered nearly evenly.

Figure 7.1

Training and Management Education



7.3 Survey Results

At the macro-foundation level, as pointed out in sections 2.11 and 2.14, competency and core competency in the RBV literature have been examined at the organizational level (Prahalad & Hamel, 1990). There has been a lack of research on resources and competency at the micro-foundation level (Barney, Ketchen & Wright, 2011). As previously discussed in chapter 1 (section 1.1), in the RBV literature, the relevant attributes of resources are divided up into physical, financial, organizational and human resource bundles (e.g., Prahalad & Hamel, 1990; Stalk, Evans & Shulman, 1992).

As outlined in Chapters 1 and 2, a large part of the critical literature on the concept of competency in the RBV literature involves vagueness in the terminology and difficulty in empirical measurement. Self-reported ratings of individual confidence were also obtained as an additional source with which to examine the micro-foundation at the individual level. Although as stated before (in section 2.15), confidence, unlike competency, has not been examined very much as a concept in the RBV literature, it is an important attribute, as discussed in chapter 3, section 3.13. Therefore, the inclusion of the concept of confidence provides additional support regarding embedding an attribute through training and education. This adds empirical support to the understanding of the process of human capital resource development at a micro-foundation level of the RBV.

In the following sections, first, the self-reported competency ratings on the clinical (control) tasks' results are presented and analysed. Second, the self-reported confidence ratings on the clinical (control) tasks' results are presented as additional support for the understanding of the embedding process of human capital as part of the resource bundle. Third, the self-reported competency and confidence ratings on management tasks are presented and examined with respect to the research question and aims. Finally, the additional results from the self-reported competency and confidence ratings on the numerical management task of finance and budgeting are examined.

7.4 Results of Self-Reported Ratings of Competency Data for Clinical and Management Tasks

The results of the survey for self-reported data on competency in clinical and management tasks were collected. The averages of each task categories were calculate and organized as shown in table 7.1. The complete results and calculated averages can be viewed in appendix table 9.6. These data included self-reported ratings from groups that received management training (groups that answered yes) and those that did not receive management training (groups that answered no) for each type of management training (degree, diploma/certificate, CE courses and mentorship) as well as trial and error and NO management education. As expected, the groups with formal training were much smaller than the ones that had not received training. The statistical significance was tested (see tables 7.3 and 7.4) for each of these sets of groups when examining the differences.

Table 7.1

Competency Ratings

Average Clinical and Management Task Ratings

for Different Management Training

	Self-reported ratings (averages for each group task categories)						
Management Education (Groups)	no response	very low	Low	neutral	High	very high	Total
No - - Diploma/Certificates (clinical tasks)	53	2	5	23	86	89	258
	21%	1%	2%	9%	33%	34%	100%
Yes - - Diploma/Certificate (clinical tasks)	3	0	2	6	20	20	51
	6%	0%	4%	12%	39%	39%	100%
No - - Diploma/Certificate (management tasks)	73	4	16	56	80	29	258
	28%	2%	6%	22%	31%	11%	100%
Yes - - Diploma/Certificate (management tasks)	7	0	2	10	19	11	49
	14%	0%	4%	20%	39%	22%	100%

No - - Degree (clinical tasks)	48	2	5	26	96	94	271
	18%	1%	2%	10%	35%	35%	100%
Yes - - Degree (clinical tasks)	10	0	1	3	13	19	46
	22%	0%	2%	7%	28%	41%	100%
No - - Degree (management tasks)	52	5	15	64	97	38	271
	19%	2%	6%	24%	36%	14%	100%
Yes - - Degree (management tasks)	12	0	1	7	17	9	46
	26%	0%	2%	15%	37%	20%	100%
No - - Mentorship (clinical tasks)	21	1	3	14	53	50	142
	15%	1%	2%	10%	37%	35%	100%
Yes - - Mentorship (clinical tasks)	40	1	4	16	57	64	182
	22%	1%	2%	9%	31%	35%	100%
No - - Mentorship (management tasks)	31	3	12	38	42	15	141
	22%	2%	9%	27%	30%	11%	100%
Yes - - Mentorship (management tasks)	54	2	5	29	62	29	181
	30%	1%	3%	16%	34%	16%	100%
No - - No Management Education (clinical tasks)	25	2	2	12	48	54	143
	17%	1%	1%	8%	34%	38%	100%
Yes - - No Management Education (clinical tasks)	28	1	4	14	49	46	142
	20%	1%	3%	10%	35%	32%	100%
No - - No Management Education (management tasks)	34	2	7	28	51	20	142
	24%	1%	5%	20%	36%	14%	100%
Yes - - No Management Education (management tasks)	39	2	8	34	41	17	141
	28%	1%	6%	24%	29%	12%	100%
No - - CE Courses (clinical tasks)	18	1	2	10	36	39	106
	17%	1%	2%	9%	34%	37%	100%
Yes - - CE Courses (clinical tasks)	48	2	5	20	76	74	225
	21%	1%	2%	9%	34%	33%	100%

No - - CE courses (management tasks)	24	3	9	28	31	11	106
	23%	3%	8%	26%	29%	10%	100%
Yes - - CE courses (management tasks)	68	2	9	39	74	32	224
	30%	1%	4%	17%	33%	14%	100%
No - - Trial and Error (clinical tasks)	8	1	1	3	11	12	36
	22%	3%	3%	8%	31%	33%	100%
Yes - - Trial and Error (clinical tasks)	58	2	6	28	103	103	300
	19%	1%	2%	9%	34%	34%	100%
No - - Trial and Error (management tasks)	10	1	4	9	9	2	35
	29%	3%	11%	26%	26%	6%	100%
Yes - - Trial and Error (management tasks)	83	4	13	59	98	42	299
	28%	1%	4%	20%	33%	14%	100%

The results of the tables 7.1 are illustrated in graphical format for comparison of the different management education categories. The self-reporting of competency ratings for each clinical (figures 7.2) and management (figures 7.3) are plotted on a bar graphs.

Figure 7.2

Self-reported Competency Ratings for Clinical Tasks

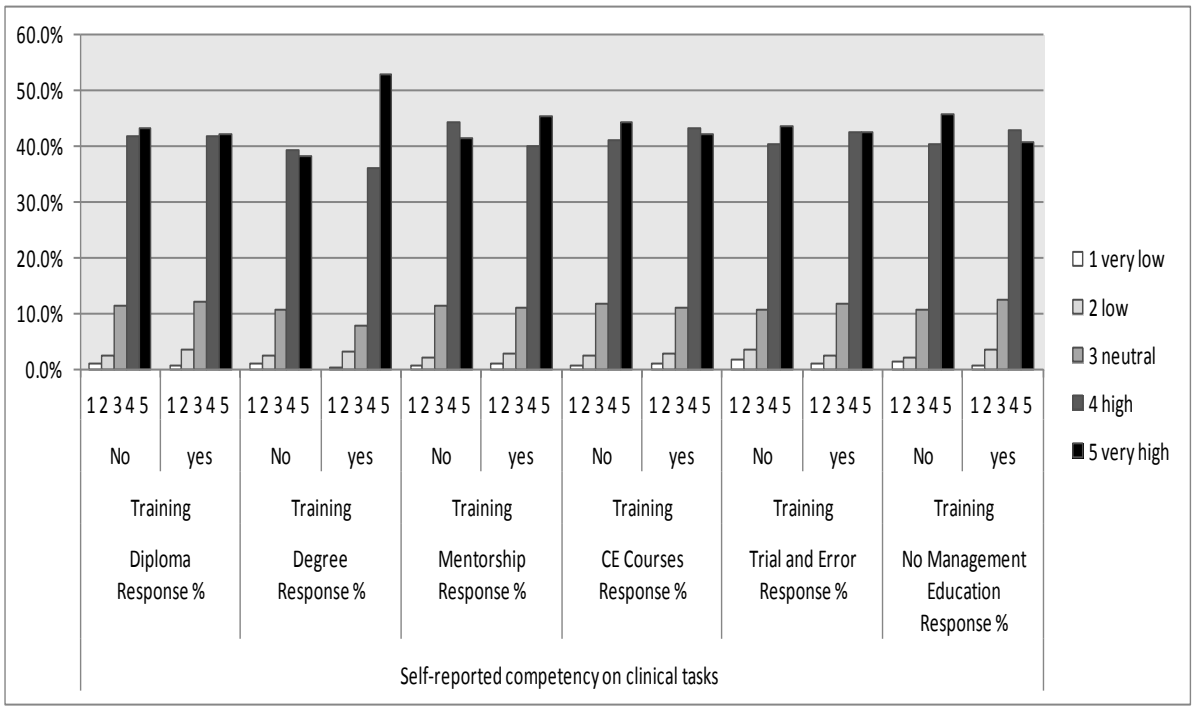
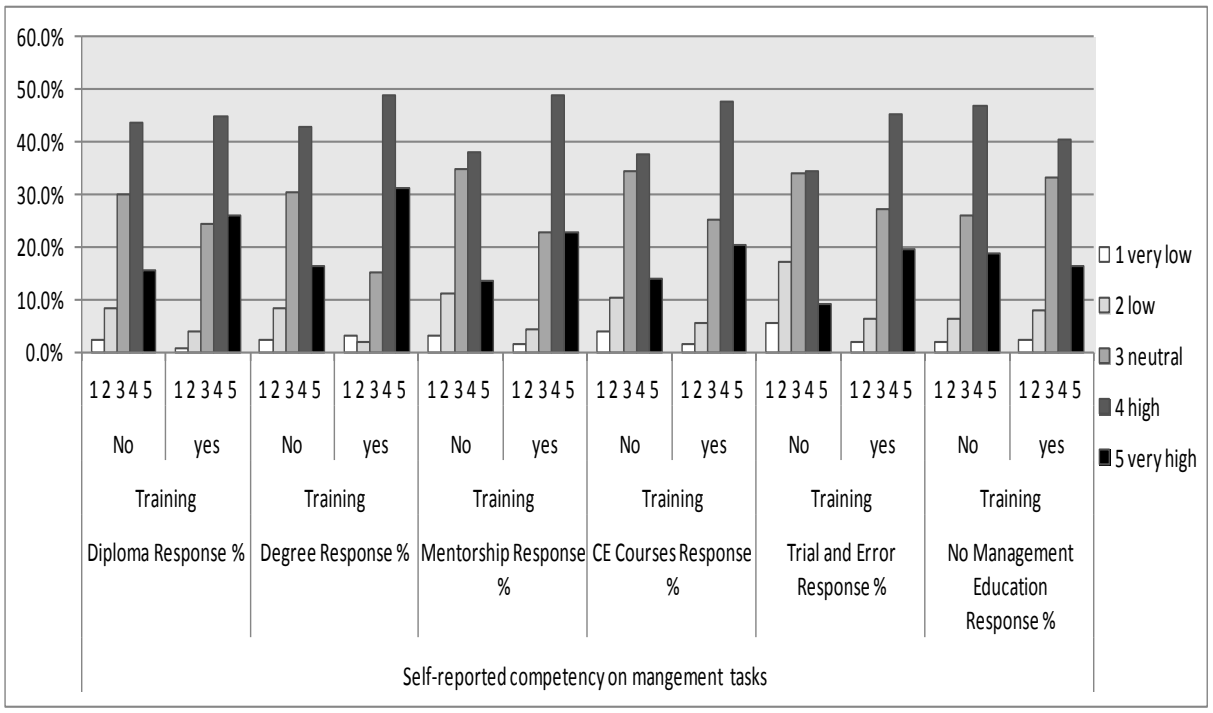


Figure 7.3

Self-reported Competency Ratings for Management Tasks



7.4.1 Self-Reported Competency Ratings on Clinical (Control) Tasks Results

In the knowledge-intensive health-care field, medical professionals (physicians) are trained in clinical tasks over many years. In Canada, all applicants to medical school must normally have at least 3 years' minimum undergraduate university education to apply to a 4-year undergraduate medical school program (University of Toronto Medical School Website, 2012). The medical school and hospital residency training can take anywhere from 9 years to become a family practice physician to 12 years or longer to become specialized in other areas of medicine (British Colombia Medical Association, 2007). With this knowledge of the lengthy and extensive training on clinical tasks in medical schools and hospitals, the self-reported ratings of competency and confidence results were used as a control. The control results were used in comparison with the results for the management tasks for each type of management training. The self-reported ratings of confidence and competency in management tasks, for which there is no or very little management training during medical school (Dsaver, 2008; Lazarus, 2009; Dwyer, 2010), could then be compared with the clinical task reporting, in which there is very lengthy – a minimum of 5 to 10 years – medical and clinical training (Deitz, 1990; University of Toronto Medical School Website, 2012).

The results of the four types of formal training (diploma, degree, and mentorship and CE courses), trial and error learning and no management education were input into a bar graph for comparison (figures 7.2, 7.3, 7.4, 7.5). In a cross-tabulation analysis, the results for the self-reported competency ratings on clinical tasks (control) indicated a very high to a high level of individually self-reported competency (figure 7.2). The medical professionals reported this high level of competency regardless of whether they had or did not have any sort of management training. There is very little to no significant difference in the self-reported competency responses between the groups that indicated that they had received training and those that stated they had not received training for each of the management training types. Although the focus of the thesis is on the specific formal types of management training categories, similar results were obtained for the trial and error and no management education categories.

7.4.2 Self-Reported Competency Ratings on Management Tasks Results

In the revitalization of the RBV and a better understanding of heterogeneous resources, scholars (e.g., Ahuja and Katila, 2004; Barney et al., 2011) have advocated the need for further research in the intermediated steps and processes that are involved in the development of a resource. The micro-foundation focus on the RBV, as discussed in section 6.4, was important in examining the path and process of the evolution of the human capital resource bundle.

The self-reported measurements of competency at an individual level constitute novel empirical data that help to fill in the human capital resource development literature gap. Regarding the management tasks, the results obtained from the medical professionals indicate that there is a drop in self-reported competency in management tasks for the different types of management training. The self-reported competency results for management tasks suggest that management training plays a role in the embedding process of individual-level competency in the development of the human capital resource bundle. The results indicate that management training has a positive effect on the self-reported individual-level competency in management tasks.

The results for self-reported individual-level competency in management tasks answered the central research question as outlined in chapter 1, section 1.3.1. The different methods of management training of medical professionals affect the embedding of competency of the human capital resources from a self-reported individual-level perspective as illustrated by figure 7.3. The results presented in table 7.3 and 7.4 indicate that there is a small observable statistically significant difference for some individual tasks between the ratings of the management trained (yes) group and the ratings of the management non-trained (no) group. These statistically significant differences in the two groups will be further analysed and discussed in sections 7.9 and 7.10.

An examination of the results in figure 7.3 shows that for each type of formal training there is a small increase in the self-reported individual-level competency of

medical professionals. This is indicated by the comparison of the two groups, those that had received management training (yes groups) and those that had not received management training (no groups) for each management training category. The shift is seen in the likert-scale measurements. The high and very high self-ratings are greater for the groups that had received management training (yes groups) than the ones that had not received management training (no groups). At the other end, the low and very low self-ratings are lower for the groups that received management training (yes groups) than the ones that did not receive management training (no groups).

In the final category, the management education was asked in reverse. On the flip side, the reverse is observed for the results for the no management education group category, as expected. The results for the group of respondents that indicated that they had no management education (by answering yes) and the group of respondents that indicated that they had received management education (by answering no) were similar to the other management training groups.

7.5 Results for Self-Reported Confidence

As also discussed previously, the micro-foundation and the evolutionary process and path of resource development (embedding of resources) are still at an early stage of theoretical development (Barney et al., 2011). Also discussed previously in chapter 3 (section 3.9), there are challenges and difficulties relating to concepts and terminologies in the literature (Priem & Butler, 2001). These challenges need to be addressed through further empirical research to support the underpinnings of the concepts. The RBV literature emphasizes the concept of organizational-level competency (see section 2.14). Although the primary focus of the study began with the RBV literature on competency in the process of resource development, confidence was also examined to gain knowledge from embedding a different trait in the human capital resource bundle. The results for the concept of confidence were also included in a comparative analysis of trait terminologies in the embedding process of the human capital resource. Adding confidence results to the study added further evidence and support to the understanding of the embedding

process of human capital as part of the resource bundle. The results and analysis of confidence, similar to the self-reported competency data, for clinical and management tasks are replicated in figures 7.4 and 7.5. The results of the self-reported confidence ratings on the clinical (control) tasks and on the management tasks are discussed in the following two sections.

The results of the survey for self-reported data on confidence in clinical and management tasks were all collected and organized as shown in table 7.2. The complete results and calculated averages can be viewed in appendix 9.7. These data included self-reported ratings from groups that received management training (yes groups) and those that did not receive management training (no groups) for each type of management training (degree, diploma/certificate, CE courses and mentorship) as well as trial and error and NO management education.

Table 7.2 Confidence Ratings

Average Clinical and Management Task Ratings for Different Management Training

	Self-reported ratings (averages for each group task categories)						
Management Education (Groups)	**no response**	**very low**	**low**	**Neutral**	**high**	**very high**	**Total**
No - - Diploma/Certificates (clinical tasks)	28	2	5	28	95	99	257
	11%	1%	2%	11%	37%	39%	100%
Yes - - Diploma/Certificate (clinical tasks)	2	0	1	6	19	21	49
	4%	0%	2%	12%	39%	43%	100%
No - - Diploma/Certificate (management tasks)	58	5	14	59	90	32	258
	22%	2%	5%	23%	35%	12%	100%
Yes - - Diploma/Certificate (management tasks)	4	0	2	11	22	11	50
	8%	0%	4%	22%	44%	22%	100%
No - - Degree (clinical tasks)	26	1	6	30	103	104	270
	10%	0%	2%	11%	38%	39%	100%

Yes - - Degree (clinical tasks)	6	1	1	3	15	20	46
	13%	2%	2%	7%	33%	43%	100%
No - - Degree (management tasks)	52	5	15	64	97	38	271
	19%	2%	6%	24%	36%	14%	100%
Yes - - Degree (management tasks)	12	0	1	7	17	9	46
	26%	0%	2%	15%	37%	20%	100%
No - - Mentorship (clinical tasks)	7	1	3	17	57	56	141
	5%	1%	2%	12%	40%	40%	100%
Yes - - Mentorship (clinical tasks)	26	1	4	16	63	71	181
	14%	1%	2%	9%	35%	39%	100%
No - - Mentorship (management tasks)	26	3	10	38	49	16	142
	18%	2%	7%	27%	35%	11%	100%
Yes - - Mentorship (management tasks)	41	2	6	34	66	33	182
	23%	1%	3%	19%	36%	18%	100%
No - - No Management Education (clinical tasks)	18	2	3	13	50	57	143
	13%	1%	2%	9%	35%	40%	100%
Yes - - No Management Education (clinical tasks)	12	1	3	17	55	53	141
	9%	1%	2%	12%	39%	38%	100%
No - - No Management Education (management tasks)	26	1	7	30	55	23	142
	18%	1%	5%	21%	39%	16%	100%
Yes - - No Management Education (management tasks)	32	3	7	34	46	19	141
	23%	2%	5%	24%	33%	13%	100%
No - - CE Courses (clinical tasks)	10	0	2	12	38	43	105
	10%	0%	2%	11%	36%	41%	100%
Yes - - CE Courses (clinical tasks)	26	2	5	22	84	85	224
	12%	1%	2%	10%	38%	38%	100%

No - - CE courses (management tasks)	21	3	8	27	36	12	107
	20%	3%	7%	25%	34%	11%	100%
Yes - - CE courses (management tasks)	51	2	8	46	81	36	224
	23%	1%	4%	21%	36%	16%	100%
No - - Trial and Error (clinical tasks)	3	0	1	4	13	14	35
	9%	0%	3%	11%	37%	40%	100%
Yes - - Trial and Error (clinical tasks)	34	2	6	31	111	115	299
	11%	1%	2%	10%	37%	38%	100%
No - - Trial and Error (management tasks)	8	1	3	9	12	3	36
	22%	3%	8%	25%	33%	8%	100%
Yes - - Trial and Error (management tasks)	68	3	13	63	106	46	299
	23%	1%	4%	21%	35%	15%	100%

Similar to the competency table 7.1 results, the results for confidence (table 7.2) are presented in a similar manner. The results of the tables 7.2 are illustrated in graphical format for comparison of the different management education categories. The self-reporting of competency ratings for each clinical (figures 7.4) and management (figures 7.5) are plotted on a bar graphs.

Figure 7.4
Self-reported Confidence Ratings for Clinical Tasks

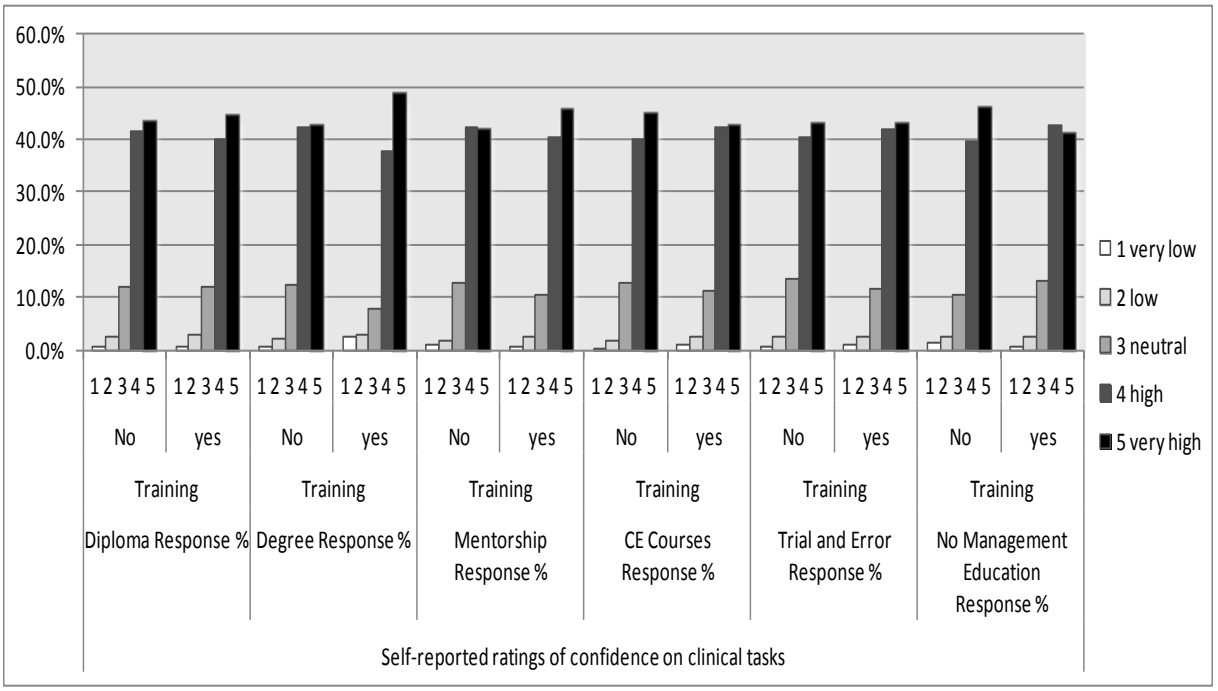
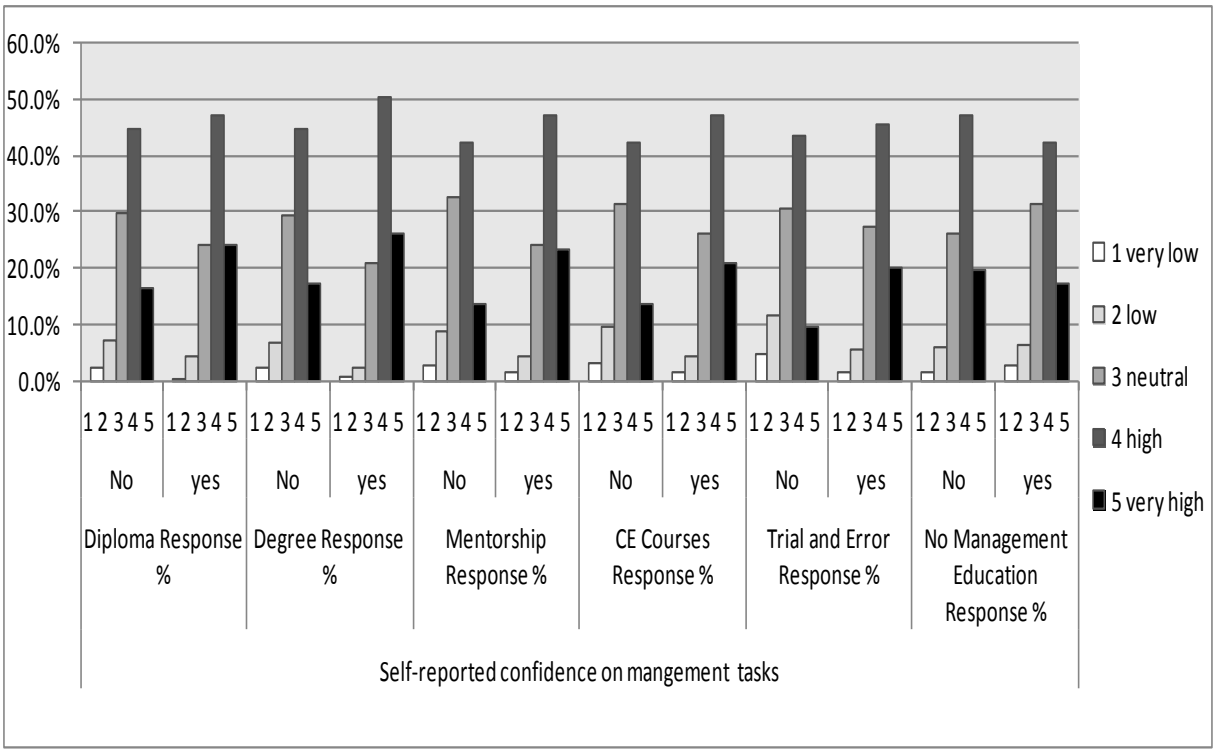


Figure 7.5
Self-reported Confidence Ratings for Management Tasks



7.5.1 Self-Reported Confidence Ratings on Clinical (Control) Tasks Results

The use of this second distinct concept (confidence) provided additional support for its embedding through the different types of management training. The self-reported confidence ratings on clinical (control) tasks for the different management trainings are presented in figure 7.4. The self-reported confidence ratings on clinical (control) tasks' results were nearly identical to the self-reported competency ratings on clinical tasks' results. As discussed in chapter 3 (section 3.9), the limitations are associated with the measurement of vague and imprecise terminologies and concepts such as competency. The empirical testing of the additional concept helps to support and overcome some of the limitations associated with the development of the RBV.

Much like the self-reported competency results, there are also two primary findings for the clinical tasks (control) survey results. First, the results indicate that physicians reported a very high to high level of confidence for both groups: those who stated that they had received training and those who stated that they had not received training for each of the management training types. Second, there is very little to no significant difference in the self-reported confidence responses between the groups whose members indicated that they had received training and those whose members stated that they had not received training for each of the management training types (see figure 7.4).

7.5.2 Self-Reported Confidence Ratings on Management Tasks' Results

Similarly to the ratings for clinical tasks, confidence was also tested. This again was used to examine another individual-level trait terminology in comparison with the individual-level competency. The confidence trait results paralleled the competency trait results. An examination of the results in figure 7.5 indicates that for each type of formal training there is a small increase in the self-reported individual-level confidence of medical professionals.

7.6 Statistical Analysis (Cross-Tabulation)

A cross-tabulation was performed in creating the contingency tables to analyse the results from the multivariate frequency distributions of statistical variables. The averages of the self-ratings on clinical and management tasks were analysed. The averages for the participants who had received management training (yes groups) and those who had not received management training (no groups) for each management training category were used in the calculations. The cross-tabulation involved:

A. The different types of management training and education
B. The averages of the competency and confidence self-reported ratings level along the various clinical and management tasks.

7.7 Statistical Analysis Dealing with Missing values and outliers

7.7.1 Missing values

Missing values are a common challenge when analyzing the data collected. Heitjan and Rubin in 1991 introduced the term course data as being the subset of the complete data set, which is neither entirely missing or perfectly present, in which the true or unobservable data lie. Missing values are part of the more general concept of coarsened data, which includes numbers that have been grouped, aggregated, rounded, censored, or truncated, resulting in partial loss of information (Heitjan & Rubin, 1991). Multiple options have been proposed in dealing with missing values by various scholars (e.g., Hair et al., 2006; Honaker and King, 2010; Liu et al., 1997). Some of the proposed methods include removing cases with missing values, replacing the missing values (imputation) or leaving them in place (Grzymala-Busse and Hu, 2000; Hair et al., 2006). There are advantages and disadvantages with each method of dealing with missing values. The study acknowledges missing values in the individual task category variables and chose to exclude the cases in a listwise deletion prior to the multi-variant analysis in

empirical studies as explored by some scholars (Croy and Novins, 2005; Hair et al., 2006).

Some Scholars (e.g., Honaker and King, 2010) have argued for multiple amputations and against the wide use of listwise deletion pointing out that most analyst partially contaminate their data on coding and approximately over 90% use listwise deletion in eliminating entire observations with a loss of 33% of the data if a single variable is missing on the initial procedure. In dealing with how to deal with missing data each study results must be considered with respect to the options available and the bias into the parameter estimate which it brings. Other scholars (Hair et al., 2006; Little and Rubin, 2002) have pointed to the advantages and appropriateness and wide use of listwise deletion in reducing the data set in that it offers simplicity, comparability, applicability to common statistical packages because all the calculations start from a common sample base. In the case of values that are (completely) missing at random listwise deletion will not introduce significant bias into parameter estimates (Acock, 2005, Allison, 2001). The use is particularly appropriate if the numbers of deleted incomplete cases is relatively small or if the listwise deleted cases are very similar to the complete cases (Penn, 2005).

Initially, prior to conducting the multi-variant analysis with excluding all incomplete cases (45 cases out of 395) which logged on to the survey site but did not rate the clinical and management task) from subsequent analysis. The removal of the cases did not have an overall big impact on the study for two reasons. First, the missing values in the remaining 350 sample were very small in number within a large sample size of 350. Second, the study created composites of the tasks by averaging the categories for each set together, thus creating new variables. These variables do not have the missing values because they are the averages of the existing data sets.

7.7.2 Outliers

Outliers are extreme or unusual (large or small) observed values that are very far from the main body of a distribution (Antonius, 2003). There are several causes for outliers to manifest themselves in the data. Hair et al (1998) identified several of these causes as:

1. Data entry errors or improper coding
2. Unusual combination of variables (seen in multi-variant analysis)
3. Unusual circumstances or extra ordinary events
4. No explanation available

The study did acknowledge the possibility of outliers in the descriptive data analysis of 192 multi-variants cross tabulation results. Since extreme outlier can significantly impact the calculation of average values and standard deviation, their inclusion was carefully considered. In considering if outliers should be included or not, one needs to consider the sample size and the distance of the outliers from the rest of the values (Sweet and Grace-Martin, 2008). In this study there are a very large number of univariant analyses on ordinal rating scale (192 separate cases), from which averages from 3 to 5 individual task categories were plotted for each type of management training. The outliers were not excluded in the study results. These extreme values (outliers) do not pose a great problem for the study for two reasons. First, for each (multiple) management training, the study uses a sufficiently large (350) sample size (Meyers et al., 2006) therefore outliers are less of a problem. Second, for each (multiple) management training the averages of ordinal ratings in each multiple task categories are used that indicated similar pattern results for each type of training. The averages of multiple tasks indicated similar close tight patterns (these plotted graphs are illustrated in figures 7.2, 7.3, 7.4, 7.5). Even if the univariant normality is observed that doesn't necessarily mean that multi-variant normality will also hold (Stevens, 2002). Observing and comparing similar patterns of average ratings for multiple management training categories of large sample size data decreases the outlier problem further more. The study also used Non-parametric tests for checking significance in the results.

Mann–Whitney U and Kendall tau tests were performed on the data sets to test the null hypothesis (significance level). The advantage of using Mann Whitney U and Kendal Tau tests are that they make few or no assumptions about the distributions, and do not rely on distribution parameters, therefore the study significance test results are less affected by the outliers. This is common to all non-parametric techniques.

7.8 Results of the Non-Parametric Test (Mann–Whitney U and Kendall Tau Test)

As discussed previously in the methodology chapter 5, the Mann-Whitney and Kendall tau were chosen for the statistical testing of the data results based on their suitability as examined in sections 5.10.2 and 5.10.3. Mann–Whitney U test is used to assess whether the two sets of ranked scores are representative of the same population. The measurement of association, looking at difference between probabilities, was examined using the Kendal tau correlation coefficient test. In the case that there is a random pattern for the two distributions, Ho is accepted; if the value of U detects a non-random pattern, then Ho is rejected (Sprinthall, 2000). The **null hypothesis (Ho)** tested in this study is that there is no difference in the self-reported ratings for confidence or competency between the averages for participants who had received management training (yes groups) and the averages for those who had not received management training (no groups) for each management training category (where p <= .05). The null hypothesis results using the Mann–Whitney U test of all the clinical and management categories with the different types of management training and education are shown in table 7.2. The results for this non-metric statistical analysis indicate the rejection of the null hypothesis at the 95% level of confidence for confidence and competency for some of the tasks and not others. The **alternative hypothesis (H1)** is that there is a difference in the self-reported ratings for confidence or competency between the groups that received a certain type of management training and education and those that did not receive that type of management training or education. The p values for all the clinical and management categories are reported in table 7.3. A fifth category, finance/budgeting, which is not correlated in the previous sections (figures 7.2, 7.3, 7.4, 7.5), is also tested in the two non-parametric tests. The

finance (numerical) category was analysed with respect to the research question to gain a more in-depth understanding of the different types of categories of management tasks created.

The following table (7.3) of the Mann–Whitney U and (7.4) Kendal tau non-parametric statistical tests indicates whether the null hypothesis is either rejected (yes) or not rejected (no) for each clinical and management task. The null hypothesis is rejected for each individual task for which the p values are <= 0.05. The actual values are noted in appendix 6.1.

Table 7.3 Mann Whitney U Test for Management Education

Independent Samples: Mann-Whitney U	Management Education (Training)					
	Experiential Learning trial and error	Formal Degree Education	Formal Certificate Diploma Management	Continuing Education Seminars Courses	Mentorship practical training in practice	No (Non) formal Management Education
Tasks	**Reject Ho (Null Hypothesis); significance level (where p <= 0.05)**					
Confidence Self-Reported Rankings of Yes and No Groups (Clinical Tasks)						
1.Patient Exam Evaluating patient symptoms	0.525 (No)	0.967 (No)	0.735 (No)	0.679 (No)	0.722 (No)	0.158 (No)
2. Patient Exam Use of diagnostic tests for patients	0.703 (No)	0.577 (No)	0.347 (No)	0.825 (No)	0.925 (No)	0.193 (No)
3. Patient Exam Evaluating clinical test results	0.777 (No)	0.614 (No)	0.83 (No)	0.828 (No)	0.177 (No)	0.589 (No)
1. Patient Treatment Communication abilities with	0.773 (No)	0.652 (No)	0.575 (No)	0.489 (No)	0.875 (No)	0.721 (No)
2. Patient Treatment Clinical treatments for patient	0.115 (No)	0.783 (No)	0.945 (No)	0.234 (No)	0.823 (No)	0.421 (No)
3. Patient Treatment Patient advocacy	0.576 (No)	0.421 (No)	0.815 (No)	0.806 (No)	0.598 (No)	0.019 **(Yes)**
4. Patient Treatment Teamwork with staff	0.038 **(Yes)**	0.665 (No)	0.331 (No)	0.876 (No)	0.308 (No)	0 **(Yes)**
A. Continuing Education Amount of continuing education	0.433 (No)	0.112 (No)	0.102 (No)	0.834 (No)	0.449 (No)	0.193 (No)
B. Continuing Education Level of continuing course	0.221 (No)	0.073 (No)	0.17 (No)	0.639 (No)	0.223 (No)	0.417 (No)
C. Continuing Education Keeping up to date with CE	0.978 (No)	0.083 (No)	0.111 (No)	0.773 (No)	0.308 (No)	0.492 (No)
D. Continuing Education Keeping up to date with CE	0.288 (No)	0.446 (No)	0.582 (No)	0.915 (No)	0.156 (No)	0.37 (No)
E. Continuing Education Incorporating new research	0.412 (No)	0.027 **(Yes)**	0.257 (No)	0.199 (No)	0.165 (No)	0.422 (No)

A. Clinical Records Keeping good patient records	0.505 (No)	0.721 (No)	0.24 (No)	0.058 (No)	0.445 (No)	0.166 (No)
B. Clinical Records Quality of charting	0.092 (No)	0.218 (No)	0.469 (No)	0.04 **(Yes)**	0.72 (No)	0.595 (No)
C. Clinical Records Information technology	0.019 **(Yes)**	0.827 (No)	0.945 (No)	0.614 (No)	0.081 (No)	0.27 (No)
Competency Self-Reported Rankings (Clinical Tasks)						
A. Patient Exam Evaluating patient symptoms	0.783 (No)	0.59 (No)	0.473 (No)	0.744 (No)	0.62 (No)	0.098 (No)
B. Patient Exam Use of diagnostic tests for patients	0.705 (No)	0.95 (No)	0.286 (No)	0.253 (No)	0.86 (No)	0.088 (No)
C. Patient Exam Evaluating clinical test results	0.187 (No)	0.791 (No)	0.607 (No)	0.342 (No)	0.869 (No)	0.22 (No)
A. Patient Treatment Communication abilities with	0.732 (No)	0.077 (No)	0.815 (No)	0.451 (No)	0.647 (No)	0.786 (No)
B. Patient Treatment Clinical treatment for patient	0.079 (No)	0.206 (No)	0.975 (No)	0.083 (No)	0.662 (No)	0.275 (No)
C. Patient Treatment Patient advocacy	0.63 (No)	0.027 **(Yes)**	0.537 (No)	0.775 (No)	0.276 (No)	0.084 (No)
D. Patient Treatment Teamwork with staff	0.21 (No)	0.166 (No)	0.603 (No)	0.399 (No)	0.128 (No)	0.063 (No)
A. Continuing Education Amount of continuing education	0.971 (No)	0.555 (No)	0.382 (No)	0.683 (No)	0.252 (No)	0.281 (No)
B. Continuing Education Level of continuing course	0.636 (No)	0.06 (No)	0.703 (No)	0.815 (No)	0.159 (No)	0.247 (No)
C. Continuing Education Keeping up to date with the literature	0.692 (No)	0.012 **(Yes)**	0.262 (No)	0.904 (No)	0.393 (No)	0.222 (No)
D. Continuing Education Keeping up to date with the conferences	0.642 (No)	0.134 (No)	0.58 (No)	0.892 (No)	0.401 (No)	0.115 (No)
E. Continuing Education Incorporating new research	0.434 (No)	0.275 (No)	0.921 (No)	0.839 (No)	0.305 (No)	0.464 (No)

A. Clinical Records Keeping good patient records	0.861 (No)	0.197 (No)	0.193 (No)	0.052 **(Yes)**	0.166 (No)	0.048 **(Yes)**
B. Clinical Records Quality of charting	0.682 (No)	0.193 (No)	0.314 (No)	0.01 **(Yes)**	0.328 (No)	0.588 (No)
C. Clinical Records Information technology	0.081 (No)	0.338 (No)	0.874 (No)	0.26 (No)	0.067 (No)	0.092 (No)
Confidence Self-Reported Rankings (Management Tasks)						
A. Strategic Leadership Setting out a vision	0.021 **(Yes)**	0.074 (No)	0.239 (No)	0.071 (No)	0.004 **(Yes)**	0.092 (No)
B. Strategic Leadership Setting goals	0.007 **(Yes)**	0.519 (No)	0.056 (No)	0.034 **(Yes)**	0.051 **(Yes)**	0.571 (No)
C. Strategic Leadership Setting an example for others	0.01 **(Yes)**	0.093 (No)	0.033 **(Yes)**	0.034 **(Yes)**	0.046 **(Yes)**	0.515 (No)
A. Strategic management Long term planning	0.267 (No)	0.042 **(Yes)**	0.007 **(Yes)**	0.096 (No)	0.01 **(Yes)**	0.323 (No)
B. Strategic management Implementing planned strategy	0.126 (No)	0.144 (No)	0.033 **(Yes)**	0.149 (No)	0.001 **(Yes)**	0.542 (No)
C. Strategic management Decision making	0.029 **(Yes)**	0.006 **(Yes)**	0.003 **(Yes)**	0.011 **(Yes)**	0.001 **(Yes)**	0.331 (No)
A. Organizational Creativity	0.255 (No)	0.067 (No)	0.103 (No)	0.005 **(Yes)**	0.001 **(Yes)**	0.185 (No)
B. Organizational Flexibility	0.131 (No)	0.038 **(Yes)**	0.387 (No)	0.005 **(Yes)**	0.037 **(Yes)**	0.976 (No)
C. Organizational Efficient use of resources	0.553 (No)	0.076 (No)	0.015 **(Yes)**	0.067 (No)	0.02 **(Yes)**	0.123 (No)
D. Organizational Innovation	0.135 (No)	0.029 **(Yes)**	0.028 **(Yes)**	0.001 **(Yes)**	0.001 **(Yes)**	0.072 (No)
A. Human Resource Management Recruiting Staffing	0.582 (No)	0.018 **(Yes)**	0.339 (No)	0.11 (No)	0.007 **(Yes)**	0.037 **(Yes)**
B. Human Resource Management Retaining Staff	0.146 (No)	0.023 **(Yes)**	0.516 (No)	0.006 **(Yes)**	0.003 **(Yes)**	0.537 (No)
C. Human Resource Management Building teams	0.036 **(Yes)**	0.069 (No)	0.326 (No)	0.008 **(Yes)**	0.001 **(Yes)**	0.174 (No)

D. Human Resource Management Training staff	0.076 (No)	0.06 (No)	0.855 (No)	0.152 (No)	0.016 **(Yes)**	0.536 (No)
Competency Self-Reported Rankings (Management Tasks)						
A. Strategic Leadership Setting out a vision	0.062 (No)	0.01 **(Yes)**	0.137 (No)	0.021 **(Yes)**	0.002 **(Yes)**	0.02 **(Yes)**
B. Strategic Leadership Setting goals	0.009 **(Yes)**	0.035 **(Yes)**	0.147 (No)	0.056 (No)	0.048 **(Yes)**	0.422 (No)
C. Strategic Leadership Setting an example for others	0 **(Yes)**	0.005 **(Yes)**	0.006 **(Yes)**	0.001 **(Yes)**	0.003 **(Yes)**	0.042 **(Yes)**
A. Strategic management Long term planning	0.127 (No)	0.01 **(Yes)**	0.016 **(Yes)**	0.017 **(Yes)**	0 **(Yes)**	0.178 (No)
B. Strategic management Implementing planned strategy	0.006 **(Yes)**	0.04 **(Yes)**	0.028 **(Yes)**	0.038 **(Yes)**	0 **(Yes)**	0.385 (No)
C. Strategic management Decision making	0.005 **(Yes)**	0.014 **(Yes)**	0.046 **(Yes)**	0.04 **(Yes)**	0.002 **(Yes)**	0.876 (No)
A. Organizational Creativity	0.086 (No)	0.018 **(Yes)**	0.072 (No)	0 **(Yes)**	0 **(Yes)**	0.055 (No)
B. Organizational Flexibility	0.01 **(Yes)**	0.02 **(Yes)**	0.028 **(Yes)**	0.003 **(Yes)**	0.002 **(Yes)**	0.859 (No)
C. Organizational Efficient use of resources	0.109 (No)	0.004 **(Yes)**	0.008 **(Yes)**	0.051 **(Yes)**	0.009 **(Yes)**	0.908 (No)
D. Organizational Organizational Innovation	0.102 (No)	0.007 **(Yes)**	0.014 **(Yes)**	0.008 **(Yes)**	0 **(Yes)**	0.899 (No)
A. Finance Managing money	0.627 (No)	0.057 (No)	0.581 (No)	0.655 (No)	0.298 (No)	0.764 (No)
B. Finance Control of capital	0.625 (No)	0.083 (No)	0.528 (No)	0.921 (No)	0.346 (No)	0.49 (No)
C. Finance Creation of budgets	0.32 (No)	0.022 **(Yes)**	0.412 (No)	0.095 (No)	0.049 **(Yes)**	0.472 (No)
A. Human Resource Management Recruiting Staffing	0.061 (No)	0.044 **(Yes)**	0.083 (No)	0.025 **(Yes)**	0 **(Yes)**	0.089 (No)
B. Human Resource Management Retaining Staff	0.001 **(Yes)**	0.023 **(Yes)**	0.257 (No)	0.004 **(Yes)**	0 **(Yes)**	0.369 (No)

C. Human Resource Management Building teams	0.001 **(Yes)**	0.062 (No)	0.393 (No)	0.001 **(Yes)**	0 **(Yes)**	0.09 (No)
D. Human Resource Management Training staff	0.003 **(Yes)**	0.024 **(Yes)**	0.101 (No)	0.039 **(Yes)**	0.002 **(Yes)**	0.148 (No)

Table 7.4

Kendall tau (b and c) Test (Using Non-Parametric Data Independent Samples)

Kendal Tau Test for Correlation	**Management Education (Training)**					
	Experiential Learning trial and error	Formal Degree Education	Formal Certificate Diploma Management	Continuing Education Seminars Courses	Mentorship practical training in practice	No (Non) formal Management Education
Tasks	**Reject Ho (Null Hypothesis); significance level (where p <= 0.05)**					
Confidence Self-Reported Rankings (Clinical Tasks)						
1.Patient Exam Evaluating patient symptoms	0.487 (No)	0.976 (No)	0.724 (No)	0.678 (No)	0.721 (No)	0.155 (No)
2. Patient Exam Use of diagnostic tests for patients	0.695 (No)	0.59 (No)	0.373 (No)	0.825 (No)	0.925 (No)	0.19 (No)
3. Patient Exam Evaluating clinical test results	0.772 (No)	0.615 (No)	0.832 (No)	0.828 (No)	0.175 (No)	0.588 (No)
1. Patient Treatment Communication abilities with	0.762 (No)	0.647 (No)	0.579 (No)	0.49 (No)	0.875 (No)	0.721 (No)
2. Patient Treatment Clinical treatments for patient	0.076 (No)	0.781 (No)	0.955 (No)	0.22 (No)	0.822 (No)	0.42 (No)
3. Patient Treatment Patient advocacy	0.58 (No)	0.411 (No)	0.818 (No)	0.808 (No)	0.599 (No)	0.017 **(Yes)**
4. Patient Treatment Teamwork with staff	0.058 (No)	0.673 (No)	0.374 (No)	0.876 (No)	0.308 (No)	0 **(Yes)**

A. Continuing Education Amount of continuing education	0.443 (No)	0.13 (No)	0.114 (No)	0.835 (No)	0.446 (No)	0.19 (No)
B. Continuing Education Level of continuing course	0.244 (No)	0.092 (No)	0.165 (No)	0.642 (No)	0.219 (No)	0.416 (No)
C. Continuing Education Keeping up to date with the literature	0.978 (No)	0.13 (No)	0.132 (No)	0.775 (No)	0.305 (No)	0.491 (No)
D. Continuing Education Keeping up to date with the conferences	0.319 (No)	0.5 **(Yes)**	0.594 (No)	0.915 (No)	0.153 (No)	0.368 (No)
E. Continuing Education Incorporating new research	0.457 (No)	0.021 **(Yes)**	0.271 (No)	0.225 (No)	0.165 (No)	0.42 (No)
A. Clinical Records Keeping good patient records	0.491 (No)	0.731 (No)	0.235 (No)	0.05 **(Yes)**	0.443 (No)	0.163 (No)
B. Clinical Records Quality of charting	0.082 (No)	0.212 (No)	0.47 (No)	0.037 **(Yes)**	0.72 (No)	0.595 (No)
C. Clinical Records Information technology	0.028 **(Yes)**	0.815 (No)	0.942 (No)	0.63 (No)	0.079 (No)	0.266 (No)
Competency Self-Reported Rankings (Clinical Tasks)						
A. Patient Exam Evaluating patient symptoms	0.77 (No)	0.571 (No)	0.489 (No)	0.741 (No)	0.619 (No)	0.096 (No)
B. Patient Exam Use of diagnostic tests for patients	0.696 (No)	0.95 (No)	0.298 (No)	0.254 (No)	0.86 (No)	0.086 (No)
C. Patient Exam Evaluating clinical test results	0.157 (No)	0.787 (No)	0.619 (No)	0.339 (No)	0.869 (No)	0.217 (No)
A. Patient Treatment Communication abilities with patients	0.725 (No)	0.045 **(Yes)**	0.812 (No)	0.453 (No)	0.647 (No)	0.786 (No)
B. Patient Treatment Clinical treatments for patients	0.06 (No)	0.174 (No)	0.976 (No)	0.078 (No)	0.66 (No)	0.273 (No)
C. Patient Treatment Patient advocacy	0.604 (No)	0.019 **(Yes)**	0.546 (No)	0.777 (No)	0.275 (No)	0.081 (No)

D. Patient Treatment Teamwork with staff	0.23 (No)	0.161 (No)	0.626 (No)	0.401 (No)	0.127 (No)	0.061 (No)
A. Continuing Education Amount of continuing education	0.972 (No)	0.603 (No)	0.374 (No)	0.688 (No)	0.248 (No)	0.279 (No)
B. Continuing Education Level of continuing course	0.665 (No)	0.071 (No)	0.708 (No)	0.817 (No)	0.156 (No)	0.244 (No)
C. Continuing Education Keeping up to date with the literature	0.718 (No)	0.027 **(Yes)**	0.264 (No)	0.906 (No)	0.389 (No)	0.22 (No)
D. Continuing Education Keeping up to date with the conferences	0.69 (No)	0.165 (No)	0.588 (No)	0.893 (No)	0.398 (No)	0.111 (No)
E. Continuing Education Incorporating new research	0.514 (No)	0.304 (No)	0.922 (No)	0.843 (No)	0.301 (No)	0.462 (No)
A. Clinical Records Keeping good patient records	0.848 (No)	0.183 (No)	0.21 (No)	0.042 (No)	0.161 (No)	0.045 **(Yes)**
B. Clinical Records Quality of charting	0.664 (No)	0.195 (No)	0.316 (No)	0.005 **(Yes)**	0.323 (No)	0.587 (No)
C. Clinical Records Information technology	0.107 (No)	0.31 (No)	0.861 (No)	0.269 (No)	0.065 (No)	0.088 (No)
Confidence Self-Reported Rankings (Management Tasks)						
A. Strategic Leadership Setting out a vision	0.021 **(Yes)**	0.021 **(Yes)**	0.053 **(Yes)**	0.224 (No)	0.073 (No)	0.003 **(Yes)**
B. Strategic Leadership Setting goals	0.009 **(Yes)**	0.009 **(Yes)**	0.497 (No)	0.051 **(Yes)**	0.037 **(Yes)**	0.049 **(Yes)**
C. Strategic Leadership Setting an example for others	0.015 **(Yes)**	0.015 **(Yes)**	0.082 (No)	0.02 **(Yes)**	0.033 **(Yes)**	0.043 **(Yes)**
A. Strategic management Long term planning	0.209 (No)	0.209 (No)	0.028 **(Yes)**	0.009 **(Yes)**	0.1 (No)	0.009 **(Yes)**
B. Strategic management Implementing planned strategy	0.114 (No)	0.114 (No)	0.114 (No)	0.034 **(Yes)**	0.161 (No)	0.001 **(Yes)**

C. Strategic management Decision making	0.037 **(Yes)**	0.037 **(Yes)**	0.003 **(Yes)**	0.001 **(Yes)**	0.01 **(Yes)**	0.001 **(Yes)**
A. Organizational Organizational Creativity	0.264 (No)	0.039 **(Yes)**	0.074 (No)	0.004 **(Yes)**	0.001 **(Yes)**	0.182 (No)
B. Organizational Flexibility	0.122 (No)	0.015 **(Yes)**	0.377 (No)	0.004 **(Yes)**	0.035 **(Yes)**	0.976 (No)
C. Organizational Efficient use of resources	0.545 (No)	0.069 (No)	0.017 **(Yes)**	0.061 (No)	0.019 **(Yes)**	0.119 (No)
D. Organizational Innovation	0.124 (No)	0.027 **(Yes)**	0.029 **(Yes)**	0.001 **(Yes)**	0.001 **(Yes)**	0.07 (No)
A. Human Resource Management Recruiting Staffing	0.577 (No)	0.018 **(Yes)**	0.321 (No)	0.105 (No)	0.005 **(Yes)**	0.035 **(Yes)**
B. Human Resource Management Retaining Staff	0.16 (No)	0.029 **(Yes)**	0.507 (No)	0.007 **(Yes)**	0.003 **(Yes)**	0.538 (No)
C. Human Resource Management Building teams	0.069 (No)	0.085 (No)	0.306 (No)	0.008 **(Yes)**	0.001 **(Yes)**	0.171 (No)
D. Human Resource Management Training staff	0.109 (No)	0.068 (No)	0.862 (No)	0.157 (No)	0.014 **(Yes)**	0.535 (No)
Competency Self-Reported Rankings (Management Tasks)						
A. Strategic Leadership Setting out a vision	0.085 (No)	0.009 **(Yes)**	0.132 (No)	0.025 **(Yes)**	0.001 **(Yes)**	0.018 **(Yes)**
B. Strategic Leadership Setting goals	0.02 **(Yes)**	0.034 **(Yes)**	0.152 (No)	0.061 (No)	0.049 **(Yes)**	0.422 (No)
C. Strategic Leadership Setting an example for others	0.002 **(Yes)**	0.004 **(Yes)**	0.004 **(Yes)**	0.001 **(Yes)**	0.002 **(Yes)**	0.041 **(Yes)**
A. Strategic management Long term planning	0.135 (No)	0.009 **(Yes)**	0.025 **(Yes)**	0.015 **(Yes)**	0 **(Yes)**	0.174 (No)
B. Strategic management Implementing planned strategy	0.007 **(Yes)**	0.025 **(Yes)**	0.027 **(Yes)**	0.038 **(Yes)**	0 **(Yes)**	0.384 (No)

C. Strategic management Decision making	0.008 **(Yes)**	0.011 **(Yes)**	0.047 **(Yes)**	0.039 **(Yes)**	0.001 **(Yes)**	0.876 (No)
A. Organizational Creativity	0.092 (No)	0.019 **(Yes)**	0.065 (No)	0 **(Yes)**	0 **(Yes)**	0.051 **(Yes)**
B. Organizational Flexibility	0.01 **(Yes)**	0.02 **(Yes)**	0.026 **(Yes)**	0.003 **(Yes)**	0.001 **(Yes)**	0.858 (No)
C. Organizational Efficient use of resources	0.132 (No)	0.005 **(Yes)**	0.006 **(Yes)**	0.052 **(Yes)**	0.008 **(Yes)**	0.908 (No)
D. Organizational Organizational Innovation	0.107 (No)	0.011 **(Yes)**	0.013 **(Yes)**	0.006 **(Yes)**	0 **(Yes)**	0.899 (No)
A. Finance Managing money	0.614 (No)	0.045 **(Yes)**	0.589 (No)	0.656 (No)	0.294 (No)	0.763 (No)
B. Finance Control of capital	0.61 (No)	0.076 (No)	0.544 (No)	0.92 (No)	0.343 (No)	0.489 (No)
C. Finance Creation of budgets	0.318 (No)	0.016 **(Yes)**	0.425 (No)	0.08 (No)	0.046 **(Yes)**	0.47 (No)
A. Human Resource Management- Recruiting Staffing	0.065 (No)	0.003 **(Yes)**	0.068 (No)	0.022 **(Yes)**	0 **(Yes)**	0.089 (No)
B. Human Resource Management Retaining Staff	0.001 **(Yes)**	0.028 **(Yes)**	0.242 (No)	0.005 **(Yes)**	0 **(Yes)**	0.369 (No)
C. Human Resource Management Building teams	0.008 **(Yes)**	0.077 (No)	0.401 (No)	0.002 **(Yes)**	0 **(Yes)**	0.086 (No)
D. Human Resource Management Training staff	0.008 **(Yes)**	0.034 **(Yes)**	0.11 (No)	0.043 **(Yes)**	0.001 **(Yes)**	0.145 (No)

7.9 Competency Result with the Addition of the Finance (Numerical) Management Task

Initially, the results for competency were analysed with respect to four sets of clinical and four sets of management tasks. In addition to the initial four management tasks (strategic leadership, strategic management, organizational and human resource management), competency was also self-rated by the medical professionals regarding one more task: finance. This was carried out to determine the possible effects of adding a task that primarily involved numbers. Although interesting, these results were not statistically significant. The null hypothesis test for a significant difference between the management trained (yes) groups and the non-management trained (no) groups could not be rejected for the majority of the self-reported competency in the finance tasks (table 7.5).

Table 7.5 Finance (Numerical Tasks) Categories

Mann-Whitney Test	Experiential Learning trial and error	Formal Degree Education	Formal Certificate Diploma Management	Continuing Education Seminars Courses	Mentorship practical training in practice	No formal Management Education
Reject Ho (Null Hypothesis); significance level is 0.05						
Competency on Management Tasks						
A. Finance	0.627	0.057	0.581	0.655	0.298	0.764
Managing money	(No)	(No)	(No)	(No)	(No)	(No)
B. Finance	0.625	0.083	0.528	0.921	0.346	0.49
Control of capital	(No)	(No)	(No)	(No)	(No)	(No)
C. Finance	0.32	0.022	0.412	0.095	0.049	0.472
Creation of budgets	(No)	**(Yes)**	(No)	(No)	**(Yes)**	(No)

7.9.1 Finance (Numerical Tasks)

Although there is an initially observed difference in the results indicating a drop in self-reported competence between the two sets of data, there is little statistical difference as indicated by the test for significance for competency in finance tasks. The only statistically significant differences were observed in the creation of a budget for formal degree and mentorship training. Although, in this study the finance task categories did not indicate a broad statistically significant result, this may still be an interesting avenue to explore in much more detail in future studies because of the more quantitative or numerical nature of these tasks. A differentiation of personal finance and organizational finance task could also be examined in understanding the statistical non-significant results obtained for this study. In future studies it may be helpful to probe specific finance tasks in an in-depth questionnaire on more specific finance task categories.

7.10 Clinical (Control) Task Categories: Test of Significance (Null Hypothesis) Results and Analysis of Competency and Confidence

The tables 7.3 and 7.4 indicate the individual tasks in which the null hypothesis was rejected. The acceptance of the null hypothesis means that there was no difference between the groups that received management training (yes groups) and the groups that did not receive management training (no groups). The results, shown in tables 7.3 and 7.4, also indicate that the null hypothesis was not rejected for the vast majority of individual clinical tasks. The difference between the groups that received management training (yes group) and the groups that did not receive management training (no group) was not significant (the p values are > 0.05) for the vast majority of clinical tasks. This indicated, as expected, that there was no significant difference in the self-reported ratings of competency and confidence by medical professionals with or without management training in (control) clinical tasks. The medical professionals indicated a high level of statistically significant self-reported competency and confidence regardless of their management training.

7.11 Comparative Analysis of Competency and Confidence Results

The results as observed from tables 7.3 and 7.4 for confidence were similar and nearly identical to the results for competency. On the clinical (control) tasks, the confidence results for the self-reported ratings (figure 7.4) were similar to the competency results for self-reported ratings (figure 7.2). The medical professionals indicated a high level of confidence regardless of having or not having any sort of management training. Regarding the management tasks, the confidence results for the self-reported ratings (figure 7.5) were similar to the competency results for self-reported ratings (figure 7.3). The medical professionals indicated a drop in self-reported confidence similar to the competency results on management tasks for the different types of management training. In the statistical analysis of the null hypothesis test, much like the competency results, there was no significant difference between the participants who had received management training (yes groups) and those who had not received management training (no groups) for the clinical tasks. The non-parametric test results for the confidence data, like the competency data, are outlined in tables 7.3 and 7.4 as well. The similarity of embedding the individual-level confidence and competency traits as indicated by the results for the clinical and management tasks adds further empirical evidence of understanding the process of embedding in human capital resources.

7.12 Self-Reported Ratings of Confidence and Competency on Management Tasks

A side-by-side graph of the averages of all of the management tasks' self-reported results (figures 7.6.1, 7.6.2, 7.6.3, 7.6.4, 7.6.5, and 7.6.6) indicates that both the confidence and the competency reported ratings are similar and follow a similar pattern in self-reporting for each type of management training. These graphed results do not provide evidence of embedding competency and confidence since there are mixed statistical significance test (rejecting the null hypothesis) results for all the individual task categories (see tables 7.4 and 7.4). The statistical significance was tested for the difference between the yes group (with management education) results and the no group (without management education) results. The graphs only indicate evidence of the similarity of self-reporting

between the two attributes that were tested. This result is important to the understanding of the process of embedding different attributes (e.g., confidence and competency) in human capital.

Figure 7.6 (Management Tasks) Self-Ratings for Confidence and Competency

Figure 7.6.1 Diploma/Certificate (Management Tasks) Self-Ratings for Confidence and Competency

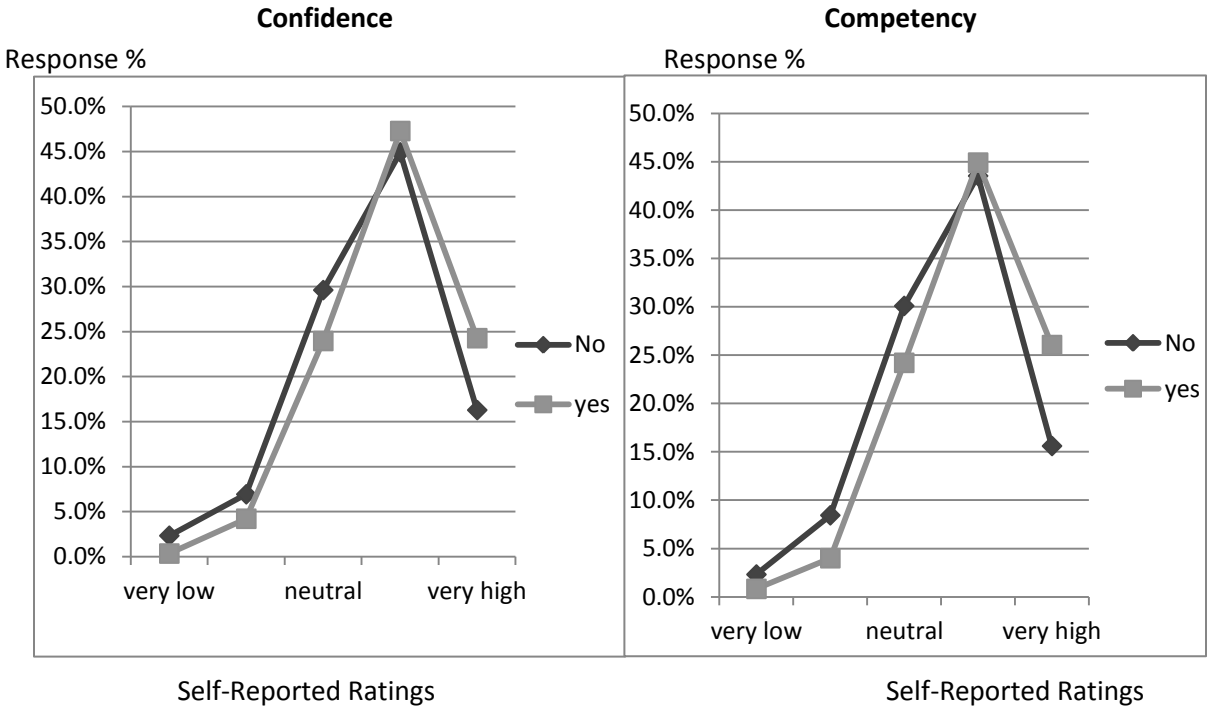


Figure 7.6.2 Degree (Management Tasks) Self-Ratings for Confidence and Competency

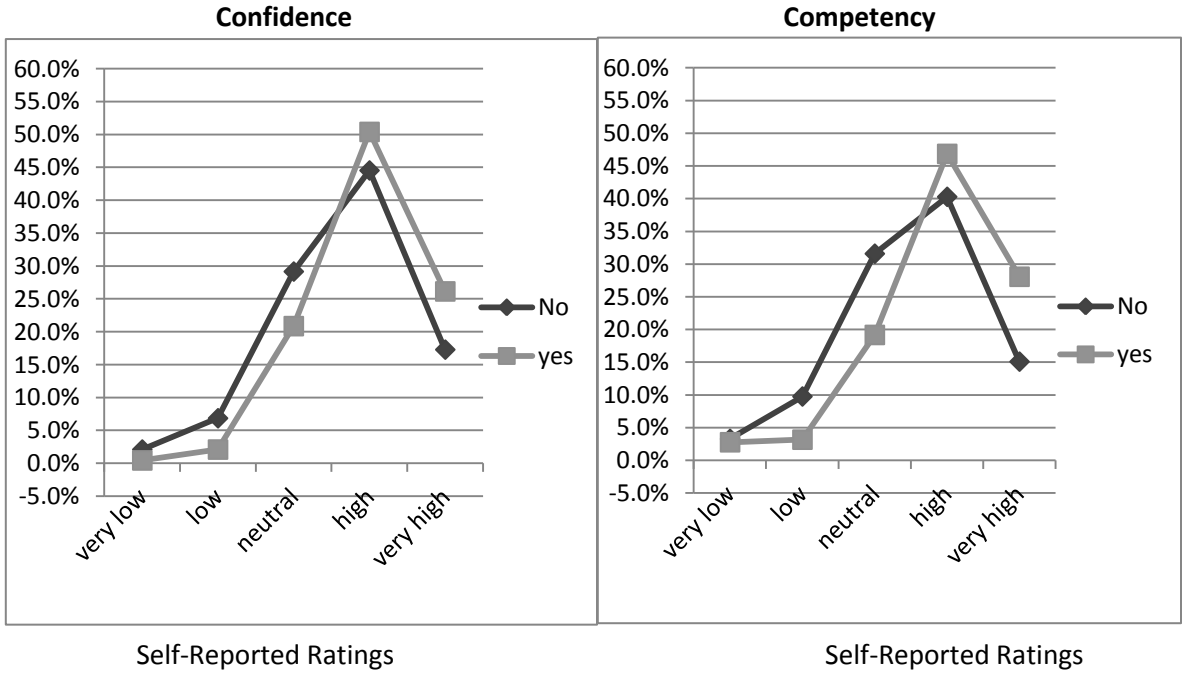


Figure 7.6.3

Mentorship (Management Tasks) Self-Ratings for Confidence and Competency

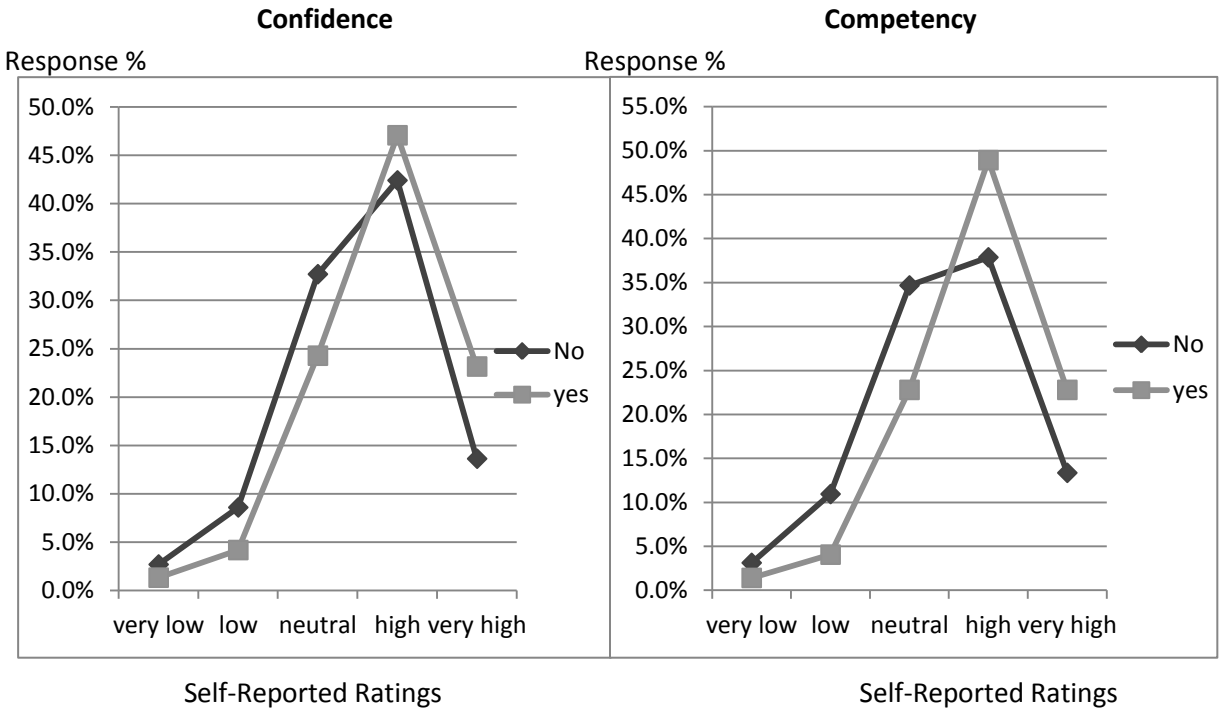


Figure 7.6.4 CE Courses (Management Tasks) Self-Ratings for Confidence and Competency

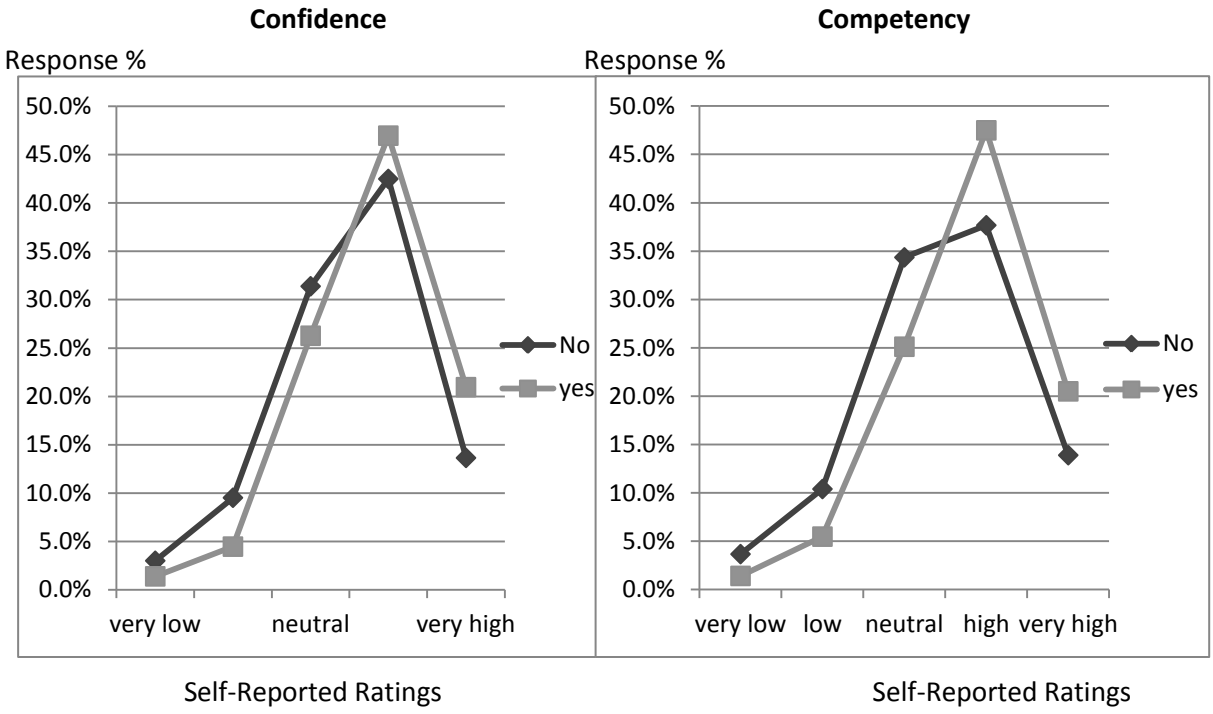


Figure 7.6.5 Trial and Error (Management Tasks) Self-Ratings for Confidence and Competence

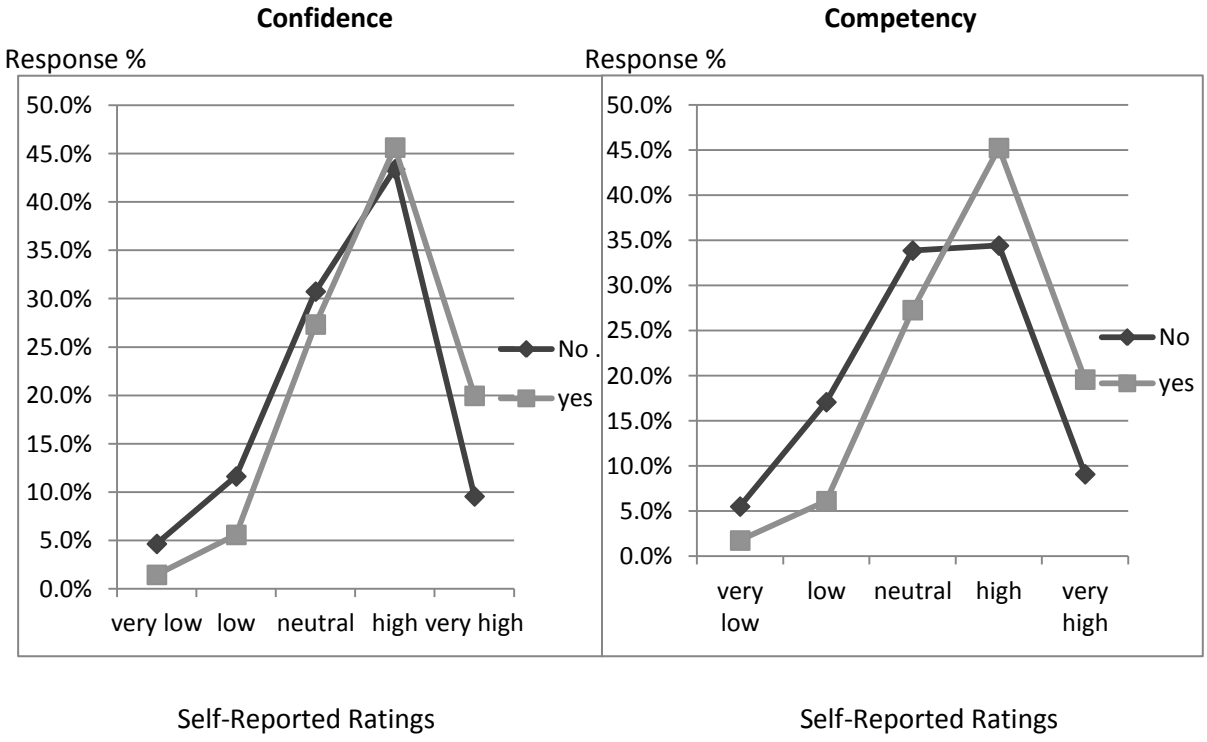
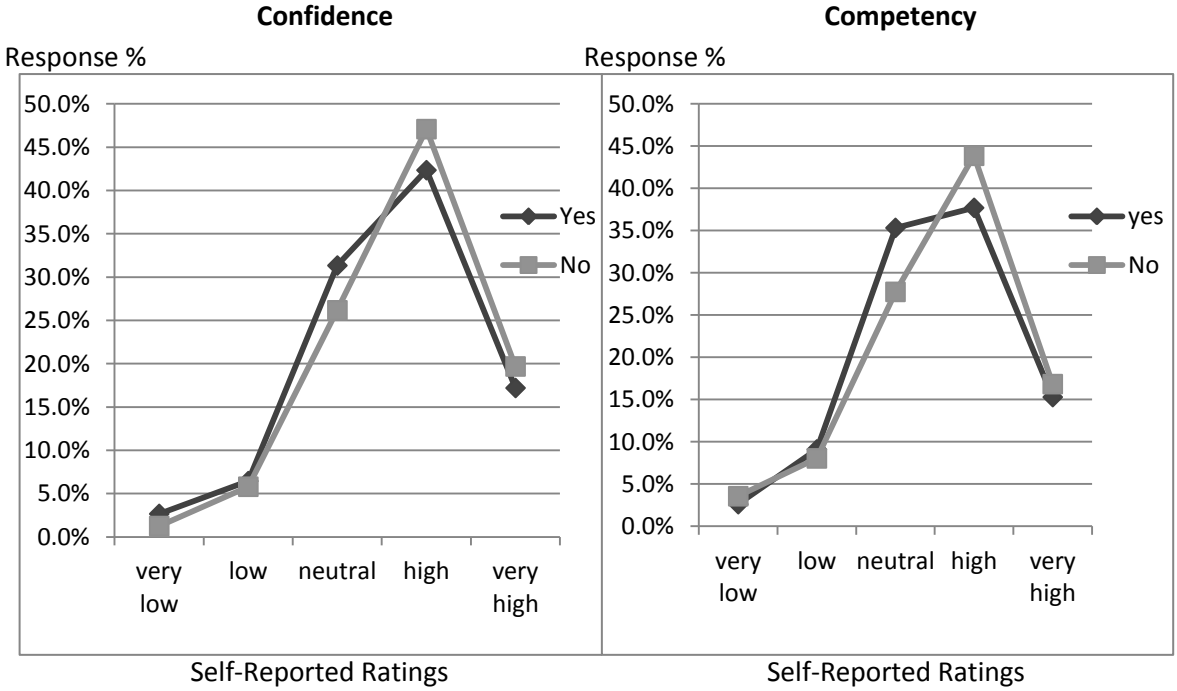


Figure 7.6.6 No Management Education (Management Tasks) Self-Ratings for Confidence and Competency



*Important to note that when the medical professionals were asked in reverse, if they had no management education (yes-no management education and no-no management education), as expected the yes and no group's results were reversed.

Since the above graphs show the average results of competency and confidence for all the management task categories and they only indicate similarities in the embedding process, a further analysis and comparison of only the competency groups that indicated statistical significance are presented and discussed in sections 7.14, 7.15, and 7.16. These results are important to the aim of the study and the thesis question because they indicate some statistically significant evidence of embedding intangible competency through training.

7.13 Management Tasks: Test of Significance (Null Hypothesis) Results and Analysis of Competency

The results, as indicated by tables 7.3 and 7.4, indicate that the null hypothesis was rejected for many individual management tasks but not for others. The difference between the groups that received management training (yes groups) and the groups that did not receive management training (no groups) was significant (the p values are <= 0.05) for many of the management tasks. This indicated, as expected, that there was a significant difference in self-reported ratings of competency and confidence by medical professionals with or without management training on management tasks. The medical professionals indicated a higher level of statistically significant self-reported competency and confidence in many of the management tasks with management training (yes groups) than without management training (no groups).

7.14 Focus on Self-Reported Competency with Management Training

The results from the Mann–Whitney U and Kendal tau null hypothesis tests indicated that the null hypothesis was rejected only for some individual categories. As previously discussed in section 6.10, in the rejection of the null hypothesis there is a difference in the self-reported ratings for confidence or competency between the averages for participants who had received management training (yes groups) and

the averages for those who had not received management training (no groups) for each management training category (where p <= .05).

In the first part of the results, the average competency and confidence of all the clinical and management tasks were examined. In the second part, the study focuses on the examination of competency only, for two reasons: first, the results for confidence were very similar or nearly identical to the competency results and second, competency as a concept was recognized in the seminal literature (e.g., Barney, 1996; Prahalad & Hamel, 2001). In this section, competency is examined in more depth as a result of aligning the study concept with the concept used in the RBV literature. In this section, the results and analysis of the data for the differences in the self-rated competency for four formal types of training and education (degree, diploma/certificate, mentorship and CE courses) on management tasks are presented. Specifically, the percentage difference between the groups that had received management training and education and those that had not is compared for each of the four different types of management training and education. These four management training and education types were chosen based on the Mann–Whitney U and Kendal tau statistical analysis of the test for the null hypothesis (see tables 7.3 and 7.4).

In this section, a more in-depth analysis of the seven same statistically significant tasks for four formal training groups (degree, diploma/certificate, CE courses and mentorship) is conducted. A summary of the categories in which the null hypothesis was rejected is presented in table 7.6. The seven groups of task categories that met the significance test (the p values are <= 0.05) for all four management types of management training were examined. A comparative analysis was performed on the same management task categories for each mode of formal training that indicated statistical significance (see table 7.6) for the self-reported competency ratings (see figure 7.7). The percentage difference between the groups that had received management training and education and those that had not received the same management training and education was plotted on a graph (figure 6.5).

7.15 Self-Reported Individual-Level Competency Results for Degree, Diploma, CE Courses and Mentorship Management Training

Seven of the same management task categories in which the null hypothesis was rejected (statistically significant task categories, where $p <= 0.05$) were analysed for the four types of formal training (degree, diploma, CE courses and mentorship). As previously stated in section 2.13, the RBV literature emphasizes the concept of competency with little or no mention of confidence; therefore, the study further analysed the competency results. This focus was only on the competency results because the plotted pattern results for self-reported confidence in clinical and management tasks were very similar or nearly identical (see figures 6.1, 6.2, 6.3 and 6.6) to the competency results.

Table 7.6 Mann Whitney U Significance Test for 7 Management Tasks

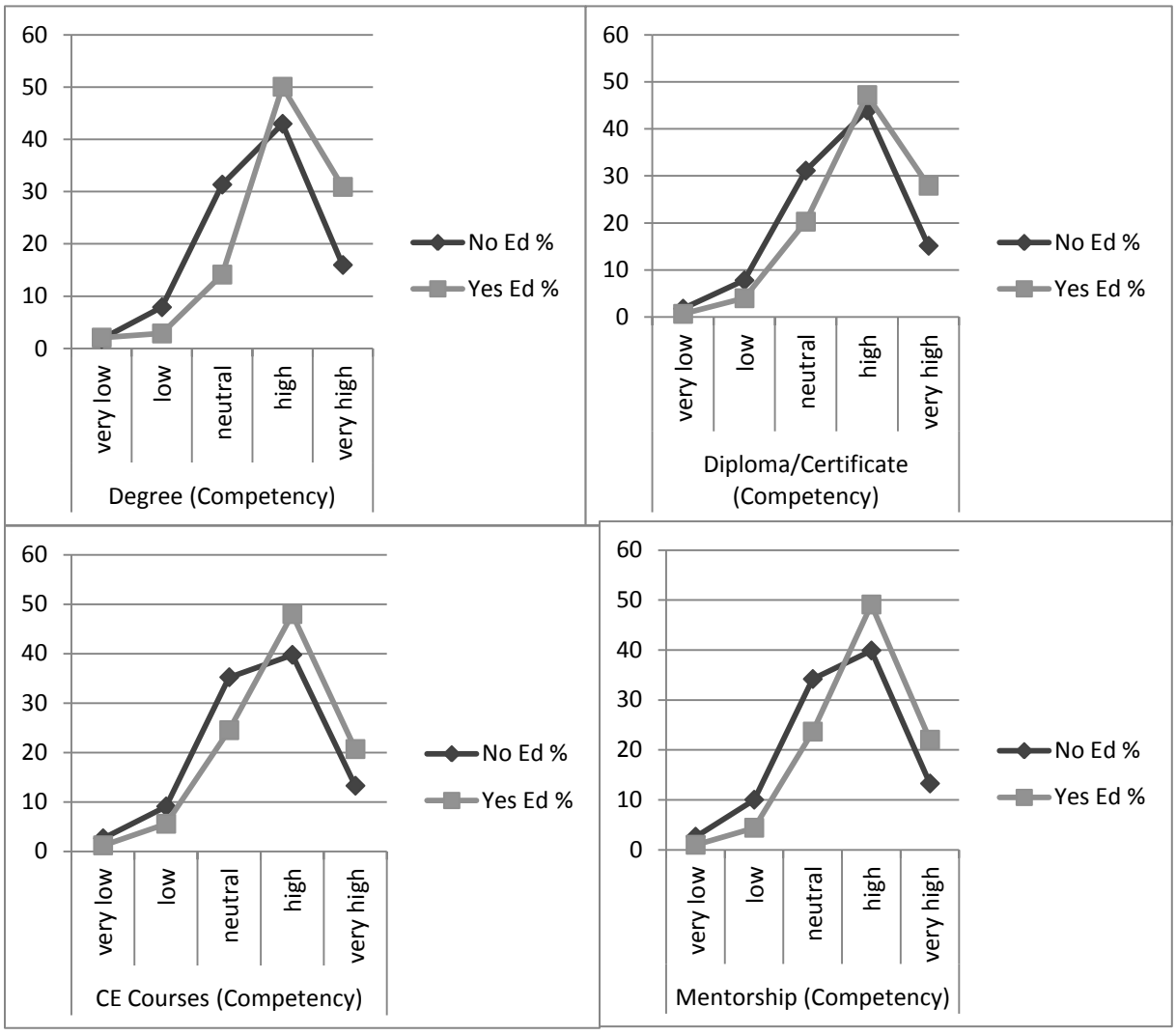
Competency Self-Reported Rankings (7 Management Tasks)	Formal Degree Education	Formal Certificate Diploma Management	Continuing Education Seminars Courses	Mentorship practical training in practice
	Significance test (Null Hypothesis Rejected)			
C. Strategic Leadership Setting an example for others	0.004 **(Yes)**	0.004 **(Yes)**	0.001 **(Yes)**	0.002 **(Yes)**
A. Strategic management Long term planning	0.009 **(Yes)**	0.025 **(Yes)**	0.015 **(Yes)**	0 **(Yes)**
B. Strategic management Implementing planned strategy	0.025 **(Yes)**	0.027 **(Yes)**	0.038 **(Yes)**	0 **(Yes)**
C. Strategic management Decision making	0.011 **(Yes)**	0.047 **(Yes)**	0.039 **(Yes)**	0.001 **(Yes)**
B. Organizational Flexibility	0.02 **(Yes)**	0.028 **(Yes)**	0.003 **(Yes)**	0.002 **(Yes)**
C. Organizational Efficient use of resources	0.004 **(Yes)**	0.008 **(Yes)**	0.051 **(Yes)**	0.009 **(Yes)**
D. Organizational Organizational Innovation	0.007 **(Yes)**	0.014 **(Yes)**	0.008 **(Yes)**	0 **(Yes)**

7.16 Competency Results for Management Training of Degree, Diploma/Certificate, and Mentorship and CE Courses

The average difference or the positive shift in self-reported competency in the self-reported ratings between the trained (yes) and non-trained (no) groups was calculated and examined. The results of self-rated competency in the individual management tasks that indicated a statistically significant difference are presented in table 7.7 and plotted on a graph in figure 7.7. The results are important because they indicate statistically significant evidence of embedding competency in human capital. These graphed results (figure 7.7) for the seven statistically significant task categories for management tasks are similar to the average graphed results (figure 7.6.1, 7.6.2, 7.6.3, 7.6.4, 7.6.5, and 7.6.6). While they both indicate a difference between the groups with management training and those without, the graphs in figure 7.7 are statistically significant.

Figure 7.7

Self-Reported Competency on Seven (Statistically Significant) Management Tasks for Degree, Diploma, CE Courses and Mentorship



In table 7.7, a comparison of the self-reported rankings between the trained (Yes) and non-trained (No) groups on four types of management training and education (degree, diploma/certificate, CE courses, and mentorship) for seven individual tasks was made. These were all statistically significant as the null hypothesis was rejected (see table 7.6). The absolute average percentage difference between the (the yes group) with management training and those with no management training (the no group) is calculated in table 7.7.

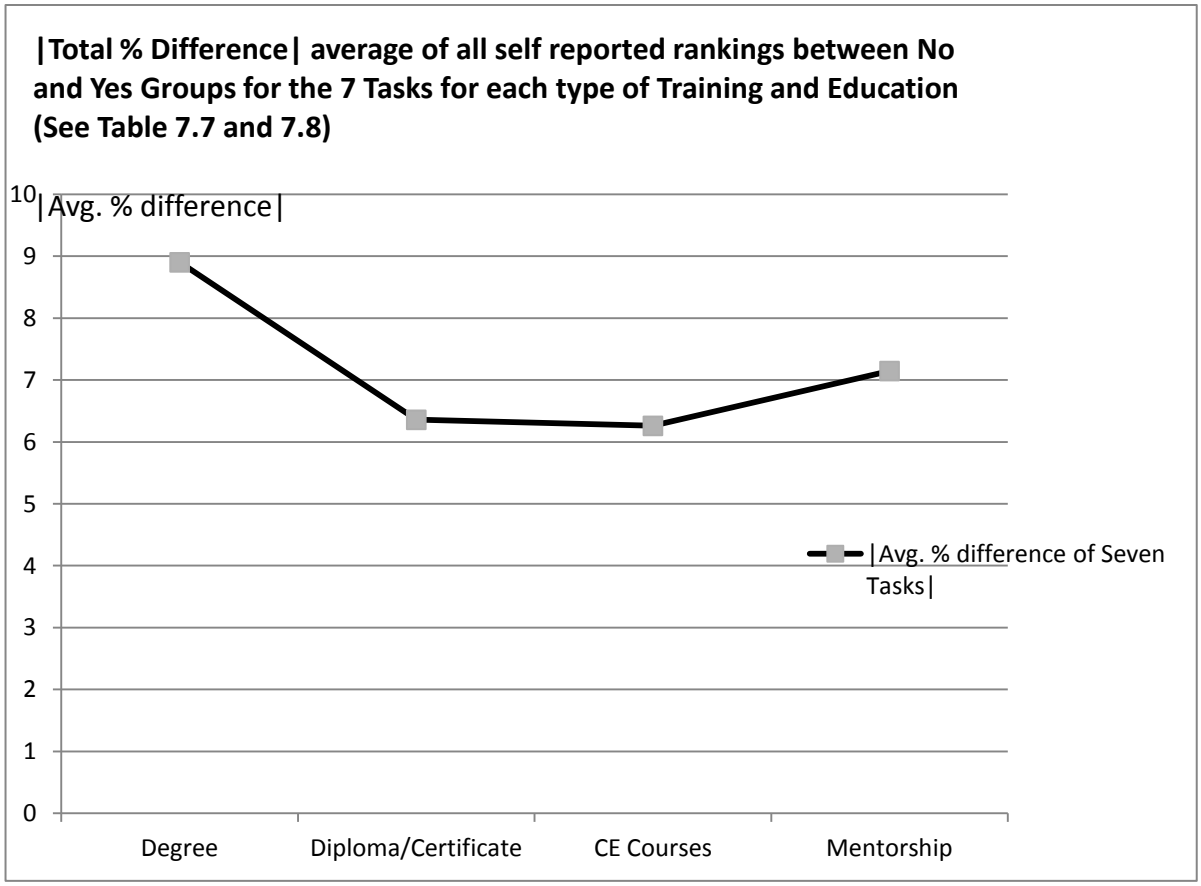
Table 7.7 Comparison of the Self-Reported Rankings between the Trained (Yes) and Non-trained (No) Groups (In the Four Types of Management Education for Seven Individual Tasks after Rejecting the Null Hypothesis)

	|% average difference of Each Self-Reported Rankings between the Yes and No Groups|					
Training and Education	**very low**	**low**	**Neutral**	**high**	**very high**	**|Total % Difference| average of all self reported rankings (between those that received management training and those that did not receive management training)**
Degree	|-0.2486|	|-5.0302|	17.2131	7.0794	14.9385	8.9020
Diploma Certificate	|-1.1116|	|-3.8125|	10.8539	3.2378	12.7718	7.3576
CE Courses	|-1.4303|	|-3.5087|	10.7148	7.4314	7.41472	6.2600
Mentorship	|-1.6199|	|-5.614|	10.5342	9.2025	8.75826	7.1458

The individual Self-Reported Rankings results (table 6.12) of the trained (Yes groups) and non-trained (No groups) medical professionals for the four management training types (Degree, Diploma, CE Courses and Mentorship) is illustrated in figure 7.8.

Figure 7.8

Percentage Increase in Self-Reported Competency Due to Management Training (Diploma/Certificate, Degree, CE Courses and Mentorship)



The results of the increase in competency in table 7.7 and illustrated plotting in figure 7.7 indicate consistency with the RBV literature. The results indicate some evidence of the practicalities of embedding the new human capital resource bundle as previously discussed in sections 1.1 and 2.10. Tables 7.6 and 7.7 indicate that there is an observable statistically significant increase between the ratings of the trained (yes) and non-trained (no) groups. These plotted results in figure 7.7 indicate that physicians who had received management training self-reported an increase in competency in management tasks over the physicians who had not received management training. The results also indicate a difference in the level of competency between the different types of management training (degree, diploma/certificate, and mentorship and CE courses) groups. The results indicate a

difference in competency reported in the four groups of management training and education (degree, diploma/certificate, and mentorship and CE courses) as indicated in figure 7.8. The increased competency (percentage difference of self-reported ratings between the two groups) is calculated in table 7.7. The difference between the ratings of the two (trained (yes) and non-trained (no)) groups indicated that physicians who received degree management training and education had the highest increase in competency reported at 8.9%. The second-highest increase was in the diploma/certificate group at 7.4%, followed mentorship group at 7.1%, and finally the smallest increase was achieved by the CE course group at 6.3% (see table 7.7).

The results from the questionnaire must be examined with respect to the hypothesis, research question and the broader research aim. The focus of final chapter (8) is on the empirical and theoretical contributions of the study within the limitations of the research parameters. The final analysis, discussion and possible future research recommendations are discussed.

Chapter 8

8.0 Conclusion

8.1 Introduction

In the study, conclusions are reached based on the empirical findings as they pertain to the research aim and questions. The conclusions are made based on the context of the prevailing critiques, gaps in the literature and recent debates surrounding the way forward for the RBV. This final chapter provides a summary of the thesis, the contributions made, the limitations of the study and some suggestions for future research. The chapter is organized into four sections. The first section (8.1) provides the context and a summary of the PhD research as it applies to the theoretical progression of the RBV. The second section (8.2) provides a discussion on the mid-level theoretical contributions from the empirical findings of the study. The third section (8.3) outlines the theoretical, methodological and organizational limitations of the study. The fourth section (8.4) presents and discusses suggestions for the directions of future research.

8.2 The Study in the Context of the RBV Literature

From the early seminal contributions of scholars (e.g., Penrose, 1959; Lippman & Rumelt, 1982; Rumelt, 1984; Wernerfelt, 1984; Dierickx & Cool, 1989; Conner, 1991; Barney, 1991; Peteraf, 1993) to more recent contributions (e.g., Crook, Kechen, Combs & Todd, 2008; Kraaijenbrink et al., 2010; Barney et al., 2011) there has been much debate about the RBV's limitations, relevance and continued development into the future. The current debates on the RBV and the future direction of theoretical development and research by scholars have identified challenges and opportunities for future contributions (Kraaijenbrink et al., 2010). The prominent critics of the RBV (e.g., Miller & Shamsie, 1996; Makadok, 2001b; Priem & Butler, 2001; Foss & Knudsen, 2003; Spender, 2006; Foss et al., 2008) have identified the challenges related to generalizability, lack of applicability, poor terminology and definitions and the need for further empirical research on the RBV concepts. As previously discussed in chapter 1, among the number of critiques, a

central one is that the RBV represents a tautology: "a statement of relationship that is true by logic" cannot therefore be generalized to be a theory (Priem & Butler, 2001: p. 58). The argument against this assertion by RBV proponents is that at a definitional level all strategic management theories could be considered or reduced to tautological reasoning (Barney, 2001). This critique has been the central challenge for theoretical status. Hence, for Barney (2001: p. 42), this is an example of "Coasian tautology", which may be seen as "the ability to restate a theory in ways that make it tautological provides no insights about empirical testability of the theory whatsoever". However, in the ten years since Barney first refuted Priem and Butler's assertion that the RBV was not a theory, there has been limited progress, a point that Barney himself acknowledges (2011).

The debate over the relevance of the RBV in terms of meaningfulness, theoretical development and future direction towards the understanding of organization has reached a crossroads (Barney et al., 2011). Many of the critical voices (e.g., Priem & Butler, 2001; Foss & Knudsen, 2003; Spender, 2006; Foss et al., 2008) have not been fully satisfied with the rate of success in the RBV research up to this current stage of development. The developing RBV theory involves abundant terminologies and concepts that have yet to be fully developed and lack consensus (Priem & Butler, 2001a, 2001b). The broader literature on the RBV perspective has focused theoretically on the impact of human capital from the development of resource bundles on value creation for a firm, leading to the gaining of a competitive advantage (e.g., Becker, 1964; Amihud & Lev, 1981; Weiss, 1983; Rigdon, 1993; Lang, 1994; Barney, 1996). In the wider context of a firm's strategy for gaining competitive advantage, embedding intangible distinct capabilities and competencies is vital for its success (Hall, 1992).

Since the seminal article of Prahalad and Hamel (1990) on core competencies at an organizational level, there has been a push to focus on a micro-foundation level (Kraaijenbrink et al., 2010). One direction of this micro-foundation research focus has been towards both the individual and the organizational level in the development of human capital (Garbuio et al., 2011). The present dissertation does not attempt to prove, at a macro-foundation level, a direct causal relationship

between the development of the firm's resources and an increase in competitiveness through superior performance. The heterogeneity of observed performance measurements with respect to economic value are difficult to link directly and causally to intangible human resource attributes. The challenges in investigating the RBV conceptual theoretical claims may be overcome through inferential findings that can be made only through empirical research. In the quest to overcome these challenges, the focal point of the thesis has been on the development in the direction of a micro-foundation for the RBV through empirical research. The level of focus on the embedding of competency has been at the individual level: medical professionals. Specifically, the research attention has been on the precursor process of embedding individual-level competency and confidence through training and education in the process of development of the human capital resource bundle. This was achieved through self-reported ratings data from medical professionals' perceptions of their confidence and competency in clinical and management tasks.

As discussed earlier in chapter 1 (section 1.1), in the internal firm perspective literature, scholars have struggled to achieve consensus or any compelling explanation for the concepts of competitiveness. The resourced-based view theory has emphasized human capital as one type of valuable resource of a firm (Barney, 1996). The RBV literature assumes that the human capital valuable resource bundle is comprised of the traits or attributes of single individuals (Barney, 1996). The traits or attributes include the training, education, skills, insights, abilities, relationships and intelligence of individual managers and workers (Becker, 1964). The intangible human attributes can be classified as the assets and competencies that constitute the individual skills and know-how of employees (Becker, 1964; Hall, 1993). The RBV further posits that the acquisition or development of the human capital resource bundle can lead to gaining a competitive advantage in a particular industry (Wernerfelt, 1984; Barney, 1996).

The thesis focused on the development of the human capital resource bundle as described in the RBV. The empirical focus was on the resource development and the micro-foundation of the RBV. The results from the study at a micro-foundation level

provide empirical evidence for the path and process of developing the human capital resource bundle. The study empirical research questions asked:

1. What is the relationship between management training and education and the embedding of individual level attributes in human capital resource development?

2. In the development of human capital as part of resource development, how do different types of management training and education affect the individual attributes of medical professionals as self-reported through ratings of confidence and competency in the discharge of managerial tasks by individual practitioners?

   - and in final analysis and conclusion,

3. Are the empirical results obtained in the medical healthcare setting, examining the process of embedding individual level attributes through management training and education to develop the resource bundle consistent with the VRIN criterion as advocated by the RBV?

The study results obtained from the self-reported data of the medical professionals, who had either received management training (called here the 'yes group') or not received management training (the 'no group') in the various clinical and management tasks provided empirical evidence on the understanding of the embedding of competency and confidence in the human capital resource development process. This is important in the development of the RBV because the links and intermediately the micro-foundational analysis of resource development are under-developed. Both of these areas have been described as crucial to further revitalization of the RBV in terms of relevance as a tool of strategic management and in further theoretical development (Barney et al., 2011).

8.3 Contribution

There are underlying theoretical challenges that remain to be addressed in developing the RBV as a conceptual framework. The literature review presented earlier identified limitations and gaps in published RBV research (see chapter 3,

sections 3.9 and 3.10) which in turn highlighted opportunities for a contribution to be made. Important gaps identified in the RBV literature emphasize the need for clarification of the terminology and core concepts (Priem & Butler, 2001; Foss & Knudsen, 2003). The need for further development of the conceptual underpinnings and the empirical observation grounding of the RBV concepts is critical to the relevance of this view in strategic management (Helfat et al., 2007). The study investigates the two important gaps in the RBV literature. These gaps, identified and discussed in section 2.8.2, offered opportunities to make future research contributions to the RBV. The identified gaps in the literature were in the areas of the process of resource development, micro-foundations of the perspective, links to sustainability and competitive advantage, and links to other perspectives in strategic management (Barney et al., 2011). The study focused on two of the identified gaps, first, the micro-foundations of the RBV investigation of the process of resource development from an individual level perspective. Second, the micro-foundation investigation of the individual attributes or managerial capabilities embedded in human capital development in the medical management healthcare setting. This gap focused on the RBV assumption, that resource must be valuable, rare, in-imitable, and non-substitutable for a firm to gain competitive advantage (Barney, 1991).

In the first, the process of resource development, the understanding of the path and sequences of the evolution is at the undeveloped stage and needs further investigation (Barney et al., 2011). The study investigated the path of resource development at the embedding stage. The process of human capital resource development was investigated at the embedding stage. The study investigated the stage at which human capital is developed in the health-care sector through management training. Specifically, it examined the sequence of the links of various types of management training and the self-reported individual-level competence and confidence in clinical and management tasks.

In the second, the micro-foundations of the RBV, there has been newly formed interest. Recent studies (e.g., Coff & Kryscynski, 2011; Foss, 2011; Garbuio et al., 2011) have examined human capital, cognitive (psychology) and behavioural aspects

as important aspects in establishing the micro-foundations of the RBV. The micro-foundational-level perspectives and analysis have been focused on people, the environment and training (e.g., Coff & Kryscynski, 2011; Liu et al., 2011). The thesis investigated the micro-foundational development of human capital through the cognitive opinions of self-reported individual-level competency.

The study makes three important contributions. First, the thesis offers a mid-range theory contribution through its empirical analysis. Situated in the health-care sector, the findings indicated that there is a statistically significant self-reported ratings difference from medical professionals with and without the different types of management training, regarding clinical and management tasks. Two important conclusions can be reached from this statistical difference. First, the findings from the results suggest that there is empirical evidence that human capital resources can be developed through management training. The analysis (see tables 6.3 and 6.4) indicates statistical significance for a number of management category tasks. Second, the different types of management training can have small but statistically significant differences in the level of self-reported competency in management tasks (see tables 6.5 and 6.6). These results are discussed in more detail in sections 6.9 and 6.10. These results elaborate Chen and Chang (2010) view of the micro level analysis which regards competence as an individual-level concept in human capital. The management training findings of the study add to the importance of investing in knowledge and skills which are seen by scholar (e.g., Coleman, 1988, Pearl, 2001; Hitt and Ireland, 2002) as critical human capital resource. The clinical and management task study further extends the understanding of the specific types of firm specific human capital which are seen as vital by some scholars (e.g., Crook et al., 2011) to the firm's performance.

The second important contribution is based on the uniqueness of the embedded individual attributes or medical managerial capabilities as investigated in the broader aggregate human capital development context under the resource immobility assumption (Barney 1991, 1997), as well as in the dynamic capability stream (Eisenhardt and Martin, 2000; Teece et al., 1997). The medical healthcare setting, as discussed in chapter 4, provides an important opportunity to empirically

test the micro-foundations of the RBV and managerial capabilities variables and categories. The RBV assumes that the resource must be valuable, rare, in-imitable, non-substitutable (VIRN) (Barney, 1991), as discussed in chapter 3 (section 3.3). Specifically, in the RBV, individual attributes embedded in human capital resource or the managerial capabilities as investigated in the dynamic managerial capability literature point to the uniqueness as one of the requirement of a resource to give firm competitive advantages (Barney, 1997, Helfat and Peteraf, 2003, Teece et al., 1997). The investigation in the study, of the uniqueness of managerial capabilities developed through management training and education of medical professionals, has provided insight into the embedding of individual level attributes in human capital to satisfy the criteria of VIRN, which the RBV advocates is necessary in gaining a competitive advantage for a firm.

The managerial capabilities or individual level human capital attributes for medical professionals are valuable as the physicians are required to participate and make decisions regarding cost and quality of care which impact on competiveness as discussed under the efficiency argument in gaining net benefit or economic value as discussed in chapter 1 (section 1.5). The idea of management training and education as being easily imitated and not unique does not apply in the medical healthcare sector. The managerial capabilities or individual level human capital resource developed through managerial training and education may appear as non-unique in theory but in medical healthcare setting and practice these are rare and difficult to imitate. There is a tug and pull in time constraints and focus for medical professionals to engage in dual roles. As discussed earlier in chapter 1 (sections 1.5.2 and 1.5.3), the in-imitable and rareness of these capabilities arises from the difficulties in physicians taking very valuable time from their clinics and patient care to engage in these managerial training and duties. Also as previously indicated (chapter 7, tables 7.1 and 7.2, and appendixes 9.6 and 9.7) in the survey, there were few medical professionals that received formal Management degrees (e.g., MBA, BBA).

In summary, the importance of individual factors related to management training and engagement of medical professionals in non-clinical or non-traditional physician

(management) duties helps to fill a gap in the micro-foundation of RBV and dynamic managerial capability literature on the complexities and differences of concepts as studied in theory as opposed to how they actually function in practice.

A third contribution from the thesis is methodological. As previously discussed in chapter 1, section 1.1, and the need for more empirical support has been advocated by a number of scholars (e.g., Miller & Shamsie, 1996; Foss, 1997; Thomas & Pollock, 1999; Michalisin et al., 2004). The study provided a methodological approach to organizing and using the multiple vague concepts and terms of the RBV literature to analyse the precursor and intermediary steps in embedding of competency and human capital development. This allows the development of a template method and approach to testing human capital in other professions. The study provides a methodological template approach to test the embedding of competency and confidence of other professionals in other sectors. The results from other professionals would be helpful in comparative analysis as well as adding additional support to the current micro-foundation and resource development literature. These contributions are discussed in detail in sections 8.3.1 and 8.3.2.

8.3.1 Mid-level Theoretical Contribution through the Empirical Findings

The call for empirical research to support the underpinnings of the RBV concepts advocated by scholars, as discussed in section 1.1, was discussed (e.g., Miller & Shamsie, 1996; Michalisin et al., 2004). The primary mid-level theoretical contribution of the study was made via an empirically driven approach. The study provided some underpinnings of the RBV concepts (e.g., embedding competency and developing human capital) through empirical testing. As discussed earlier in chapter 1 (section 1.3.2), there has been considerable scholarly literature in the disaggregate dynamic capability stream on managerial capabilities (e.g. Helafat, et al, 2007; Kor and Mesko, 2013; Lo, 2012; Ludwig and Pemberton, 2011; Martin, 2011; Teece, 2009; Yien, Chen, Huang, and Huang, 2011; Winter, 2003) but since the early works from the mid-1980's, there has been limited micro-foundation literature from an aggregate RBV perspective. This micro-foundation mid-level

theoretical contribution has been promoted and called for in the advancement of resource development knowledge (e.g., Barney et al., 2011). The study supports the underpinnings of the RBV micro-foundations and human capital resource development concepts through empirically collected data. As discussed before, in section 1.5.1, the RBV advocates that human capital as one of the four bundled resources leads to increased competitive advantages for a firm. The study fills the gap in the RBV literature in advancing the understanding of how competency can be embedded in the human capital resource bundle through management training.

The study's aim was to increase the understanding of how human capital resources are embedded in the health-care sector through training. As pointed out in chapter 1, section 1.3, since the early development of the RBV, the current scholarly contributions (e.g., Maritan & Peteraf, 2011; Sirmon et al., 2011; Wernerfelt, 2011) have focused on the acquisition, diversification and organization of the resources. The precursor link of developing or embedding resources prior to the firm's use of the resources to gain competitive advantage is important yet rarely observed in the RBV literature (Barney et al., 2011). There has been a considerable amount of literature, as discussed in sections 1.3, 2.4 and 2.5, on the firm's use of its resources, competency and capabilities leading to a competitive advantage. The mid-level theoretical focus is on the precursor to this perspective, the embedding of competency attributes for the development of the resource bundle. The empirical findings contribute to the theoretical underpinnings in the micro-foundation of the process of resource development.

There are two comparative results, clinical and management tasks, that both empirically provide support for the understanding of the embedding process in the human capital resource bundle. First, the study presented results from the clinical tasks and provided a control with respect to the tested management tasks. These results were important in comparing the expected high level of competency and confidence of medical professionals in clinical tasks with the tested management tasks. As discussed previously in chapter 4, sections 4.2.2 and 4.7, the self-reported high levels of confidence and competency in clinical tasks were due to their extensive training and education in the field. These expected control results

provided further empirical evidence confirming the embedding of confidence and competency in clinical skills through the extensive medical training years.

Second, in comparison with the expected clinical control result, the study presents empirical evidence of the embedding of individual-level competency and confidence in management tasks through management training. Unlike clinical tasks, for which the medical professionals all had extensive and lengthy training, the management tasks presented a good opportunity to test the effect of having or not having different types of management training in them. The medical professionals' self-reported increase in competency and confidence with management training (for the yes group) in comparison with medical professionals without management training (for the no group) provided further empirical evidence of successful embedding in the development of human capital.

The results indicate not only a small significant difference in the competency of the medical professionals who received management training (yes group) and the medical professionals who did not (no group) but also a difference between the four formal types of management training (degree, diploma, CE courses and mentorship – figure 6.6) programs as well. This is important for the competency-embedding process because it indicates that the type of management training is also important to a small extent. This point is also supported by the high level of competency reported in clinical tasks, a result in which there is extensive and lengthy clinical training. This difference in the amount of increase in competency for the four types of management training is important for two reasons. First, although the difference between the four training groups was small, it did indicate that it is possible to increase the self-reporting of competency with changes to the type and length of training. Second, these empirical results are important to educators in examining the intensity and length of different types of management training in medical schools and residency programs and also in the careers of medical professionals. In the confidence self-reported results, although not analysed in depth like the seven competency task results (figure 7.7, table 7.7), the statistical significance test results in tables 7.3 and 7.4 indicate that there is also evidence of embedding this

trait. There are some different management task categories that indicated statistical significance (rejection of the null hypothesis).

8.3.2 Methodological Contribution

This empirical research offers a methodological template for tackling the empirical gaps regarding the theoretical underpinnings of the concepts in the RBV literature. The thesis offers an example of a mixed-methodological approach to creating empirically testable categories and dealing with associated vague and ill-defined terminologies. Evidence of competency development for other professionals (e.g., engineers, lawyers, dentist, nurses and military personnel) can be gathered through a mixed-methods approach using the present study as a guide. A survey for an empirical investigation can be developed through the same qualitative approach for testing other professionals in the health-care sector or in other industries. In testing competency for other professionals in different fields and sectors, the same approach involving the creation of categories relevant to their professional and management tasks can be followed. The initial qualitative research using the data analysis techniques of the grounded theory approach for the creation of categories in the main survey is a valuable approach for identifying test variables for the empirical testing of the RBV concepts. Once the categories had been identified, a quantitative approach was helpful in numerically testing the embedding process of the RBV.

The employment of a non-parametric approach technique in this study offered several advantages. Non-Parametric method tests do not make assumptions about the population distribution (Motulsky, 1995). The advantage of using the nonparametric tests for the study is that it required fewer assumptions about the shape or distribution of the underlying population and were useful for non-numerical ordinal responses (Siegel, 1957). As discussed in sections 5.10.1 and 7.7.2, the advantage of using non –parametric test such as, Mann Whitney U and Kendal Tau tests, are that they make few or no assumptions about the distributions, and do not rely on distribution parameters, therefore the study significance test results are less affected by the outliers.

8.4 Limitations of the Present Research

Considering the lengthy process, narrow focus and limited time to fulfill the requirements for a PhD, decisions must be made with respect to the choice of the subject, identifying the gaps in the literature, the methodology used and the contribution to be made. With these choices, a number of limitations are encountered in the study. These limitations were carefully considered with respect to the research aim and contributions. The specific theoretical, methodological and organizational limitations are discussed in this section. The study acknowledges the limitations associated with the following.

8.4.1 Terminologies and Concepts

The RBV literature proposes that a firm is comprised of resource bundles that can be leveraged to gain competitive advantage (Penrose, 1959; Wernerfelt, 1984). In the RBV, there is a lack of clarity in the underlying constructs and inherent difficulties in proving causal connections and testing complex relationships (Priem & Butler, 2001). Many broad strategic management research streams using the RBV as a tool have adopted differing terminologies and definitions. This dilemma challenges the generalizability of the results from one stream to another. The definitions of the concepts and categories of tasks are not formulated from a consensus in the resource-based view literature. There is varied acceptance of the aggregated and disaggregated view of resources and capabilities. The study takes more of an aggregated approach to resources, capabilities and competencies. These three concepts can be dissected and applied in differing frameworks as seen from the literature on dynamic capabilities (Teece et al., 1990), core competencies (Prahalad & Hamel, 1990) and the behavioural approach to the resource-based view (Bromily, 2005).

The choice of definitions and development of the concepts and categories from a broad RBV and associated literature (e.g., dynamic capabilities, behavioural approach and core competencies) places limitations on the comparative analysis for different streams. On the other hand, complementary insights may be gained from

the differing conceptualizations in the RBV literature allowing for different approaches or perspectives on similar focuses of interest. Specifically, the concept of competency in the RBV has been studied at a macro or an organizational level (e.g., Wernerfelt, 1984; Prahalad & Hamel, 1990; Peteraf, 1993; and Ryall, 1998). The thesis examined the competency at a micro-foundation level. The study employed the term competency at an individual level in the frame of human capital development. The use of qualitative data analysis in the grounded theory method was helpful for allowing categories and variables to emerge in the pilot study.

8.4.2 Developed Survey

Two limitations were associated with the creation of the survey. First, a small number (5) of interviews were conducted in the creation of the survey for the main study. The small number has some limitations regarding the generalizability of the emerged concepts and categories. The small number of interviews was used in conjunction with the literature. The interview transcripts and analysis did, however, provide very in-depth and lengthy data for the creation of the clinical and management categories for the survey. The clinical and management categories that emerged from the small sample size were also later examined with respect to the extensive literature.

Second, the subjective nature of the semi-structured interview process and the interpretation of concepts and terminologies applied by the participants may lead to difficulties in comparing the data empirically (Eriksson & Kovalainen, 2008). The qualitative data analysis techniques used in the grounded theory approach was helpful for navigating through the data analysis. Although only a partial in-depth insight was gained from the interview responses, this was complemented by the findings in the literature review. The emerged categories were subsequently examined with the existing literature on health care and management. The additional insights gained on the clinical and management tasks from the literature helped to verify the relevance and focus of the research categories.

8.4.3 Depth of Analysis

There are limitations to the depth of analysis offered as a result of the methodological choices. The mixed method played an important choice for the overall study. The qualitative phase employed in the development of the survey through the use of a pilot study gave in-depth valuable data in the creation of the clinical and management task categories. The main study was a deductive quantitative survey of a broad population of medical professionals. The quantitative phase of the study gave vital broad level of information but was limited in the depth of analysis. The goal was not to gain a deep insight but to gather some broader evidence of the embedding process in the development of human capital. The study used an ordinal five-point likert scale for measurement. The ordinal scale does not gauge the exact numerical difference between the categories on the scale. Therefore, the difference between the categories cannot be assumed to be the same numerical number (Allen & Seaman, 2007). The depth of analysis was limited by the choice of scale used. There are also challenges of response bias of either favouring neutral or extreme ratings on the scale. The study acknowledges these limitations but uses this scale because of the ease of quantifying the data and maintaining uniformity of measurement and the accepted desired level (precision) of information. The goal of the main (quantitative) study was a broader rather than an in-depth level of analysis. Therefore, the five categories of ordinal-rated responses on the likert scale were sufficient for this goal.

8.4.4 The Sample Frame of Individual Participants

The specific nature of the sample frame consisting of medical professional (physicians) participants in a specific sector (health care) and a specific country (Canada) limits the generalizability of the findings. The research relied on the voluntary participation of medical professionals (human subjects). As with any other human voluntary subject research, there are concerns regarding the validity and generalizability of the results. The findings are skewed to the subjects who chose to participate as opposed to the ones who chose not to participate. The large sample for the survey and cross-regional participation help generate confidence in

the validity of the results. The study does not make generalizability claims beyond this group, sector or region. The study does, however, offer a conceptual methodological template that may be empirically replicated across other professions, sectors and regions.

8.4.5 Direct Causal Links of Resources to Competitive Advantage

The study acknowledges the inherent difficulties in proving causal connections and testing complex relationships. The challenges to overcome are related to the selection of the independent variable to measure the capabilities and the dependent variable used to measure the performance (Ethiraj et al., 2005). This empirical study investigates the link between competence and competitive advantage based on the efficiency theory but does not attempt to prove this connection. The RBV states that a firm is comprised of resource bundles that can be leveraged to gain competitive advantage (Penrose, 1959; Wernerfelt, 1984). The development of the human capital resources is linked to competitive advantage in the RBV of a firm (Barney, 1996). The study focuses on the effects of the different modes of management training and education on self-reported competence, which is an attribute of human capital resources.

8.4.6 Self-Reported Data

The empirically driven study used data derived from Canadian medical professionals' self-rating of competency and confidence in clinical and management tasks. The self-reported method can lead to validity challenges. The challenges are related to issues of biases in self-representation and differing individual perceptions. Empirical studies have dealt with the challenges related to self-reported data methodology (e.g., Weissman & Bothwell, 1976; Vasilopoulos et al., 2000; Vazire & Mehl, 2008) over the decades. The study does not investigate the development or ranking or test for performance differences of competence from other sources (e.g., third party, objective testing or financial results). In the study, the development of the competence attribute in the human capital resources is investigated through a self-reported approach that is a measurement of subjective

perception. There are subjectivity biases related to the personal perception and cognitive process involved in the self-reported ratings by individuals. The resulting findings are derived from one source, the medical professional, which limits the source of the value creation through competency to the human capital resource. The attributes of measuring self-perceived confidence and competency in skills and tasks with or without a certain management education does not account for other possible influential factors. Even with the response bias challenges, the self-reported methodology is an important source for an empirical study that aims to contribute to the understanding of human capital.

8.4.7 Limited Frame of Scope of a PhD (Unused Rich Data)

The study collected a large amount of biographical data on the participants and opinions on management education in the survey, which were not correlated and analysed with the ratings. The reason for collecting a broad and extensive amount of data was because there are only limited opportunities to have a large sample of physician participants in studies. The difficulty in obtaining a large sample size of physicians is due to their busy schedules as well as costs related to time lost. The reasons for not including all of the data from the survey were the broad range of variables and the limited scope of the PhD's aim and central question. The study used only the relevant data to focus on the research aim and answer the research questions. This limits the scope and depth of understanding of the rankings in relation to the specific attributes of the participants (e.g., age, experience, medical school, type of practice, gender, etc.). In the process of fulfilling the requirements of a PhD dissertation, research question focus and time frame, there is a limiting effect on the analysis and inclusion of all the possible rich data collected. The survey was more extensive because it presented a very limited opportunity to gather data from a large sample of very busy professionals. There will be ample opportunity to incorporate the additional data for further correlations in future research.

8.5 Directions for Future Research

In order to strengthen the RBV, there is still a great need to support the theoretical underpinnings of the RBV concepts and premises (Priem & Butler, 2001; Foss & Knudsen, 2003; Kraaijenbrink et al., 2010). As discussed in section 1.3.1 and 3.1, the need to support the underpinnings of the concepts through empirical research is important to the continued development and usefulness of the RBV in strategic management. The previous section acknowledged the limitations of the study. This section presents and discusses promising avenues for further research that address some of the limitations and help to support the theoretical underpinnings of the RBV concepts and premises. The following sub- sections suggest several directions for future research. These suggestions are only a few examples out of many more future research paths that could be taken in the development of the RBV in the field of strategic management.

8.5.1 Research Self-Reported Individual-Level Competency of Professionals in Other Sectors

As discussed previously in the contribution sections 8.3 (sub-sections 8.3.1 and 8.3.2) the knowledge of the path and process of evolution of resource development along with the understanding of the micro-foundation of the RBV are at early stages in the literature (Barney et al., 2011). These two areas require further future investigation. The empirical research underpinning the mid-level theoretical contribution of this paper is set within the context of the health-care sector, which is a highly knowledge-intensive arena. The difficulties of measuring either the aggregate or the disaggregate capabilities of a firm within the health sector are challenges that are encountered in research studies of the RBV in other sectors and so local insights generated there may have wider applications. As pointed out in section 8.3.2 the methodological template can be used in generating categories for testing in a quantitative survey for other professionals (e.g., engineers, lawyers, dentists, nurses and military personnel).

The replication of the study in different sectors would add further empirical evidence from other sectors in tackling the empirical gaps in the theoretical underpinnings of the competency concepts in the RBV literature. This would be helpful in establishing a comparative analysis of other sectors for understanding the process of embedding the resource bundles from self-reported data. The multi-sector empirical evidence of self-reported ratings data from other professionals would also be helpful for testing the generalizability of the empirical results in the building of the micro-foundations of the RBV.

8.5.2 Comparative Analysis of Multiple Sources Ratings

In the present study, the focus was on the cognitive perception of a single rater source, the medical professional (physician). A number of scholars in the past have focused on the multiple rater system through 360 degree appraisals (e.g., Yammarino & Attwater, 1997; Cheung, 1999; Gray-Smith, 2000; Mabey, 2001; Bailey & Fletcher, 2002). Future research may investigate ratings that come from other individual sources, such as supervisors, evaluators, patients or auditors. This type of rater system was derived to obtain multiple ratings and perceptions from several different sources or people (e.g., supervisor, manager, co-worker or external observer). The additional ratings from multiple sources in addition to the self-reported data findings would add additional perspectives on the development of the micro-foundations of the RBV to the literature.

8.5.3. Linking of Data Results from Studies of Tangible and Intangible Resources

The comparative analysis of data from studies of intangible resources such as human capital with studies of tangible resources such as financial capital can provide valuable support for the micro-foundation of the RBV. The quantitative numerical data from such sources as spending, profits funding and budgets can be another source in addition to the cognitive self-reported confidence and competency data from human participants in examining resource development. This provides another source for strengthening and verifying the methodological approaches to future research. Links and comparative analysis would also help in

connecting the RBV to other external concepts and perspectives, such as market position (Makadok, 2011). These broader inter-linkages with other perspectives would help reinvigorate the RBV research and turn it in a meaningful direction (Barney et al., 2011).

8.5.4 Clarity and Organization of the RBV Terminologies and Concepts

Finally, a valuable step in the future research direction of the RBV literature would be to consolidate and organize the array of concepts and terminologies. As discussed early on in section 2.8.1 and 2.8.3 one of the weaknesses of the RBV is the lack of clarity and vagueness of the concepts and terms. This makes it very difficult to make generalizations of results between the different streams emanating from the RBV of the firm. The challenge in the study of resource or capability development in an industry lies in gauging capabilities in the human capital aspect of a resource bundle and is ill defined and vague in the context of the present definition and framework of the multidisciplinary aspects of the RBV (Priem & Butler, 2001; Rugman and Verbeke, 2002). Vague definitions and confusing terminologies in both the early and the present RBV and dynamic capability literature have been a constant challenge (Thomas & Pollock, 1999; Rugman & Verbeke, 2002; Wang & Ahmed, 2007: p. 35). A direction towards further in-depth comparative analysis of the terminologies and concepts in the RBV with other theoretical perspectives related to the development of competitive advantage would be helpful.

8.5.5 Longitudinal Management Training Studies

As indicated in sections 6.5.1 and 6.6.1, the control (clinical task) results indicated a high level of self-reported confidence and competency regardless of the management training. The extensive and lengthy medical training provided a high degree of confidence and competency in clinical tasks, as expected and confirmed by the data results. The results for the self-reported competency in management tasks indicated differences between the different management trainings (degree, diploma, CE courses and mentorship). The differences were not very great but do

leave some room for testing other modes of training and possibly longer-term training in the course of medical professionals' careers. This is important because the control (clinical task) results indicate that extensive long-term training can have a much bigger impact on self-reported competency and confidence in the clinical tasks. This can be tested for medical professionals who take on greater responsibility for management tasks and are willing to be trained over a much longer time period.

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Appendixes 9

Appendix 9.1 Literature on Emergent Clinical Task Categories (Table)

1. Patient Examination	2. Patient Treatment	3. CE Courses	4. Clinical Record
The importance of accurate diagnosis in different areas of medicine has been discussed by countless journals for numerous pathologies ranging from life and death issues of prostate cancers (Loeb and Catalona, 2008) to childhood attention-deficit/hyperactivity disorder (Rader et al., 2009). The training of student physicians in clinical examination and diagnosis in the third and fourth years of studies in medical school and hospital training is important from both a laboratory and a bedside perspective. This involves using two sets of facts, first from the use of investigative tools such as microscopes and the study of bodily fluids and tissue and second from the bedside investigation of the patient (Flexner, 1950).	Medical clinical education and training involves the art and science of combining the investigation of the medical problem and finding the clinical solutions or treatment. These types of tasks involve both aspects of medical service. The didactic learning in clinical training involves teaching medical students about possible findings and the course of action and treatments for those findings (Flexner, 1950). The practical tasks of diagnosis and treatment lie at the heart of the medical profession. In the medical curriculum, the primary focus is on acquiring knowledge and understanding that will form the core of practicing the profession. The development of skills is just as important in tasks for lifelong study and to enable the medical professional to cope with practical	The importance of up-to-date research and CE is critical in the practice of medicine. This is evident from the contribution of the evidence-based medicine approach, which was illuminated by the prestigious British Medical Journal in a survey of the 15 medical milestones since its inception in 1840 as reported in the Toronto Star (Van Rijn, 2007). The importance of continuing education is seen as vital to the profession; the General Medical Council in the UK "recommended that the aim of the undergraduate medical course should be to produce doctors with an attitude towards medicine and learning that would fit them for their future medical careers and self directed lifelong learning" (Amin & Eng, 2009: pp. 17–18). The task of self-learning and improvement is an ongoing process. The requirement to keep	The charting system and records tasks are vital from a medical, legal and business standpoint. The charting system is important in protecting medical professionals as well as patients (Nelson & Ross, 1990). This is a detailed history of interactions between the medical professional and the patient with regard to all the points of relevance from diagnosis to treatment and care. The protection of patient, staff and physicians is linked to the legal ramification of complete and thorough records. This essential task is crucial in laying out an audit trail if any records are called on for legal and other disputes. The records must be accurate and detailed, indicating the exact meanings of the charts and records for legal purposes (White, 1996).

Diagnosis or investigative tasks of the illness involve different aspects of using the scientific learning from different years of medical school with direct interaction with the patient. This is observed within the vital teaching of the clinical task of diagnosis in the collection and evaluation of facts that may be ascertained directly through the patient (Flexner, 1950). The critical need for investigation of a life and death disease requires competency in the proper diagnostic and examination tasks. An example of this is the need for routine checks for common diseases that are treatable in the early stages. "Prostate cancer is the second-leading cause of cancer death in men in the US. Consequently, there is considerable interest in the screening, detection, and treatment for this common cancer" (Loeb & Catalona, 2008: p. 36). The critical nature of exam and diagnosis in particular in medicine is evident in competency, for example in chest x-rays in which "Accurate interpretation of chest	problems in diagnosis and treatment (Sinclair, 1972). One of the key tasks of the medical profession is to care for patients and treat their illnesses. In a broad sense, "Medicine aims to cure disease, or at least relieve the suffering related to it, and where possible to prevent it from arising" (Gunderman, 2006: p. 31). This is important in the education and training of physicians with regard to understanding and learning how to apply the knowledge to the practice and day-to-day tasks. Once the exam and diagnosis have been made, the decision on the treatment of the illness may involve several pathways, which include treatment through medicines, surgery or just observation. The performance measurements are important for the prescribed treatment choice involving the clinical outcomes. The measurement of "morbidity, mortality and psychological markers" is among the performance measurements for these important tasks (Goldfarb, 2006: p. 1).	up continuously with the most up-to-date data, education, research and developments in the area of practice is essential in the area of medicine. The organization must be a learning entity striving for continuous improvement in the product and services (Gunderman, 2006). The curriculum in medical school teaches the medical student to form the basis for the practice of medicine. The medical professional, after undergoing formal education, is expected to continue to develop skills that would: 1. Aid the lifelong education process and 2. Enable the medical professional to cope better with practical problems in diagnosis and treatment (Sinclair, 1972). The task of research, self-learning and continuing education is important in bringing about innovation and new ideas to the practice of medicine. Innovation in the health-care sector similar to other sectors can provide a competitive advantage through value creation (Barr, 2006).	Charting and keeping good medical records goes back to the medical school clinical teaching of case studies. Learning in medical schools for students involves charting and note taking, in order to dissect the relevant and irrelevant factors (Sinclair, 1972). This carries on to the professional years for keeping track of illness cases with a written history in the charts over time and for diagnosis and treatment. There are numerous laws and acts related to medical records that must be abided by (e.g., Data Protection Acts, Access to Medical Report Act 1988, Access To Health Records Act 1990, Access to Personal File Act 1987 in the US; White, 1996). There are similar acts in Canada and many other nations that make the records and charting tasks essential components of the daily duties of all medical professionals. The importance of good comprehensive records and charts for patients revolves around the context of fully understanding each case by using the evidence and the narrative or storytelling approach in medicine.

radiographs (CXR) is essential as clinical decisions depend on readings" (Eisen, 2006: p. 460). The challenges of comprehensive exam and diagnostic tasks are important from several perspectives, including social context and environmental factors. The exam and diagnosis tasks of observing a patient's condition must be critically evaluated from the interwoven perspectives of illness – physical, emotional and social conditions (Curran & Cockerill, 1948). There is considerable literature on diagnosis and the possible tools available. The art and science of diagnostic tasks have to take into consideration that "If medicine is to provide optimal value to patients and our communities, it is important that we educate future physicians to understand not only how to interpret diagnostic tests, but when to use them and when not to use them" (Gunderman, 2006: p. 32).	The complexity of medical curriculum assessment can be observed in the many issues involved in the treatment and care modality. The educational process for medical practice involves the teaching and assessment of many facets of treatment and care clinical process theory, and technical and operative practice invasive and non-invasive procedures (Fish & Coles, 2005).		The need to communicate effectively about the patient and his or her illness requires meticulous and comprehensive records. One of the foundations of the Total Service Medical Practice is effective communication between practice personnel (Bradford, 1997). The importance of good records is also critical in possible liability involvement for products under laws such as the Consumer Protection Act in the US and similar laws in Canada. Good records must be maintained and include all drug preparation and equipment used for legal liability purposes (White, 1996). Electronic medical charting tasks are essential in quality, performance and goal monitoring for the health-care facilities (MacKoul, 2006).

Appendix 9.2 Literature on Emergent Management Task Categories (Table)

Strategy (Leadership)	**Strategy (Management): Planning/ Implementation**	**Organizational Skills**	**Human Resource Management**
The strategic leadership in the form of either a health-care CEO or a physician leader is an important human capital resource. Leadership strategy attributes are an important part of the human capital in the RBV literature (Barney, 1997). The value chain is an important part of understanding competitive advantage. The leaders in health care are seen as essential to the value basis in competitive advantage. The "providers, including hospitals, clinics, physician groups, and physicians are central actors in the health care system and the place where most of the value is actually delivered" (Porter & Teisberg, 2006: p. 149). In the health-care setting, the top leadership hierarchy includes physician managers. The top leadership of an	Managing the structure of an organization, measurement systems and the use of facilities should be determined by a clearly set strategy and goals (Porter & Teisberg, 2006). The resources involved with the organization and the people are linked to the planning and implementation tasks because they all require proper and efficient task planning and implementation to be successful. This task category relates the goal of achieving competitive advantage to human, finance, physical and organizational capital (Barney, 1997). Strategies in planning and implementation tasks are important in the health-care organization in clinical and management settings. The literature on the strategic management process indicates the importance of activities involving the formulation and implementation of	The organizational attributes were called resources by Wernerfelt (1984) in the RBV. The tasks involved with organizational skills are very broad and considered an important resource. Organizational capital is one of the four categories of resource capital (Barney, 1997). Organizational skills and tasks are very important in gaining and sustaining competitive advantage. "An organizational structure that corresponds to the value chain will improve a firm's ability to create and sustain competitive advantage" (Porter, 1985: p. 61). Tasks involving organizational skills are tied closely to time as an attribute of resources. The misuse and inefficiency of organizing time can have negative effects.	Human resource management forms part of the value chain, included as part of the support activities, in gaining and sustaining competitive advantage (Porter, 1995). Managing human resources is vitally important for a firm. Human capital is one of the four capital categories of resource capital that contributes to a firm's competitive advantage (Barney, 1997). People as part of a resource bundle and the management related to them are vital to an organization. Human resource management can be key to competitive advantage through its function in determining the skills motivation of workers and managing the cost of training and recruiting (Porter, 1985). In human resource

organization, such as a CEO, can be a source of competitive advantage (Harrison, 2003). Wisdom in strategy can be described as the "ability to best use knowledge for establishing and achieving desired goals" and leadership is seen as the most important factor "enabling the formation of organizational wisdom" (Boronico, 2000: pp. 19-22). Strategic leadership, in particular the importance of the CEO, is evident in developing strategies that are linked to the performance of an organization (Harrison, 2003).	strategies in gaining competitive advantage (Harrison, 2003). The importance of strategy and tasks involved in health care may be seen in its absence or the lack of it. There is an immense push for health-care delivery strategies especially with high stakes, a large scale and great complexity of tasks (Porter & Teisberg, 2006). The need to involve a wide number of people in strategic planning is important. In terms of strategic planning, the strategic decision making should be dispersed with inputs from multiple (sources) representatives in an organization (Oster, 1999). Observations indicate that strategic management considerations are low on the list of priorities in the health-care organization (Porter & Teisberg, 2006). The importance of planning and implementation must be set at a higher level of consideration.	Time management is one of the most challenging and elusive resources to be incorporated into the practice of medicine (Aluise, 1980). The design of the organizational structure and processes in the strategic management process is linked to competitive advantage (Harrison, 2003). Capabilities can be observed as a distinct organizational skill set of coordinating and exploiting the resources (Stalk, Evans & Schulman, 1997). The organizational tasks can take various forms; for example, the Importance of organizational skills and tasks may be observed in the delegation of duties. Improvements and efficiencies may come in many forms. Decentralization in the organizational design and structure has been linked to improved job satisfaction (Oster, 1999). The organizational tasks are linked to	management, the importance of training workers and improving the knowledge within an organization is a critical component of successful competition. Knowledge is an important attribute of human resources. Empirical research on the RBV supports the view that for the majority of firms, knowledge is the most strategic resource (Boronico, 2000). The capabilities of the firm to develop, incorporate and apply knowledge are crucial to the building of sustainable competitive advantages (Kogut & Zander, 1992; Nonaka, 1994). An important property in gaining a competitive advantage involves having high-quality managers and employees and better-quality training (Harrison, 2003).

		the daily operations and service in the health-care field. The competitive advantage is linked to the value creation strategy. The importance of overall organization is seen as vital to the success of firms (Best, 1990).	

Appendix 9.3

Literature on Emergent Finance/Budgeting Category (Table)

Finance/Budgeting
The task of financial health maintenance is critical for any organization. Financial capital is one of the four categories of capital resources linked to competitive advantage in the RBV literature (Barney, 1997). The importance of a strong financial position is critical to being competitive. The competitive edge would diminish and be lost if the finances are not used properly, resulting in a negative effect on the human resources, equipment and processes (Harrison, 2003). Innovation is an important component of competitive advantage. Managers can create financial and cultural ownership in the firm, leading to more innovation (Oster, 1999). The importance of financial tasks is evident in all the aspects of reducing costs and increasing value. One source of competitive advantage for a firm arises from superior control of costs (Porter, 1985). In the Canadian health-care context, this may be related to reducing the cost of the public health system to give better value to the taxpayers.

Appendix 9.4 Introductory Letter and Consent Form:

PhD Research Questionnaire

1. You are being invited to participate in a research study about the development of resources and capabilities in the healthcare setting. The purpose of the questionnaire is to gain insight into the possible relationship(s) of management education and training with respect to confidence and competency in clinical and management tasks of clinicians, physicians and medical managers. This study is being conducted by, Dr. Asif R Khan under the supervision of Professor Robert MacIntosh and Dr. Robert McMaster from The Department of Management of the Business School, at University of Glasgow. This study is being conducted as part of a graduate PhD thesis dissertation.

There are no known risks if you decide to participate in this research study. There are no costs to you for participating in this study. The questionnaire should take approximately 30 to 45 minutes to complete. The aim is to make a contribution to the literature on the development of dynamic capabilities in the health care field within the Resource-based view framework. The information collected may not benefit you directly, but the information learned in this study may provide benefits in the understanding of management education, training, and policy in dual clinical and management tasks for physicians, clinicians and medical managers.

The anonymized and coded data records will be kept securely and used solely for research and teaching purposes. The main aim is the completion of a doctoral thesis, but secondary, in the future, there is a hope to make the research known in academic meetings and conferences for possible publication of the results of the research in journals and books.

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission or as required by law. You will not be named in any reports, publications, or presentations that may come from this study. Any information about you that is received will have a code or number and will not show your name or address, or any information that directly identifies you. Strictly: Only the PhD Research related members listed below will be allowed to look at your information with due respect to abiding by strict confidentiality. If you have any additional questions at a later date, Contacts Information is provided for any concerns.

If you decide to leave the study, the information about you that was collected before you left the study will still be used. No new information will be collected without your permission. If you have any questions, please ask us. Your participation in this study is entirely voluntary. Your signature indicates that you are agreeing to participate, having read and understood the consent information provided above.

Signature

Date:

Appendixes 9.5 Research Study Survey

Name
Age
Speciality
Medical School
Practice Type
Years in Practice

Management Education	yes	no	**If yes: circle / type**	# length of time (circle no. of days/months/years)
Formal Degree Education:			BBA, MBA, other_____.	_____ Days, Months, Years
Formal Certificate/Diploma (Management)				_____ Days, Months, Years
Continuing Education: Seminars/Courses				_____ Days, Months, Years
Mentorship (practical training in practice, institution or hospital)				_____ Days, Months, Years
No formal Management Education				
Experiential Learning (trial and error)				_____ Days, Months, Years

Clinical Tasks: ***In your organization,*** **very low low neutral high very high**

department or clinic

(Please circle appropriate response: range from 1.very low to 5. very high)

Rate your confidence with respect to the following Clinical tasks

1. Patient Exam

A.	Evaluating patient symptoms	1	2	3	4	5
B.	Use of diagnostic tests for patients	1	2	3	4	5
C.	Evaluating clinical test results	1	2	3	4	5

2. Patient Treatment

A.	Communication abilities with patients	1	2	3	4	5
B.	Clinical treatments for patients	1	2	3	4	5
C.	Patient advocacy	1	2	3	4	5
D.	Teamwork with staff	1	2	3	4	5

Why are you confident to this degree?

4. Continuing Education

A. Amount of continuing education courses	1	2	3	4	5
B Level of continuing courses	1	2	3	4	5
B. Keeping up-to-date with current clinical literature	1	2	3	4	5
D. Keeping up-to-date with current clinical conferences	1	2	3	4	5
E. Incorporating new research findings into practice	1	2	3	4	5

5. Clinical Records

A. Keeping good patient records	1	2	3	4	5
B. Quality of charting	1	2	3	4	5
C. Information technology	1	2	3	4	5

What makes you confident (give example(s))?

What would make you more confident (give example(s))?

Clinical Tasks: *In your organization, department or clinic* **(Please circle appropriate response: range from 1.very low to 5. very high)** **Rate your competency with respect to the following Clinical tasks**	**very low**	**low**	**neutral**	**high**	**Very high**
	1	**2**	**3**	**4**	**5**
1. Patient Exam					
A. Evaluating patient symptoms	1	2	3	4	5
B. Use of diagnostic tests for patients	1	2	3	4	5
C. Evaluating clinical test results	1	2	3	4	5
2. Patient Treatment					
A. Communication abilities with patients	1	2	3	4	5
B. Clinical treatments for patients	1	2	3	4	5
C. Patient advocacy	1	2	3	4	5
D. Teamwork with staff	1	2	3	4	5

What made you competent to these level of degree?

4. Continuing Education

A. Amount of continuing education courses	1	2	3	4	5
B Level of continuing courses	1	2	3	4	5
B. Keeping up-to-date with current clinical literature	1	2	3	4	5
D. Keeping up-to-date with current clinical conferences	1	2	3	4	5
E. Incorporating new research findings into practice	1	2	3	4	5

5. Clinical Records

A. Keeping good patient records	1	2	3	4	5
	1	2	3	4	5
B. Quality of charting	1	2	3	4	5
	1	2	3	4	5
C. Information technology	1	2	3	4	5
	1	2	3	4	5

What makes you competent (give example(s))?

What would make you more competent (give example(s))?

Management Tasks: ***In your organization, department or clinic*** (Please circle appropriate response: range from 1.very low to 5. very high) **Rate your confidence with respect to the following management task**	**very low**	**low**	**neutral**	**high**	**very high**
	1	**2**	**3**	**4**	**5**
1. Strategic Leadership performance measure questions					
A. Setting out a vision	1	2	3	4	5
B. Setting goals	1	2	3	4	5
C. Setting an example for others	1	2	3	4	5
2. Strategy (management): planning/implementation performance measure questions:					
A. I. Long term planning	1	2	3	4	5
B. I. Implementing planned strategies	1	2	3	4	5
C. I. Decision making	1	2	3	4	5
3. Organizational performance measure questions:					
A. Organizational Creativity	1	2	3	4	5
B. Organizational Flexibility	1	2	3	4	5
C. Efficient use of resources	1	2	3	4	5
D. Organizational Innovation	1	2	3	4	5

Why are you confident to these level of degree?

5. Human Resource Management performance measure questions:

A.	Recruiting Staffing	1	2	3	4	5
B.	Retaining Staff	1	2	3	4	5
C.	Building teams	1	2	3	4	5
D.	Training staff	1	2	3	4	5

What makes you confident (give example(s))?

What would make you more confident (give example(s))?

Management Tasks: ***In your organization, department or clinic*** (Please circle appropriate response: range from 1.very low to 5. very high) **Rate your competency with respect to the following management task**	**very low**	**low**	**neutral**	**high**	**very high**
	1	**2**	**3**	**4**	**5**
1. Strategic Leadership performance measure questions					
A. Setting out a vision	1	2	3	4	5
B. Setting goals	1	2	3	4	5
C. Setting an example for others	1	2	3	4	5
2. Strategy (management): planning/implementation performance measure questions:					
A. Long term planning	1	2	3	4	5
B. Implementing planned strategies	1	2	3	4	5
C. Decision making	1	2	3	4	5
3. Organizational performance measure questions:					
A. Organizational Creativity	1	2	3	4	5
B. Organizational Flexibility	1	2	3	4	5
B. Efficient use of resources	1	2	3	4	5
C. Organizational Innovation	1	2	3	4	5

4. Finance performance measure questions:

A.	Managing money	1	2	3	4	5
B.	Control of capital	1	2	3	4	5
C.	Creation of budgets	1	2	3	4	5

What made you competent to these level of degree?

5. Human Resource Management performance measure questions:

A.	Recruiting Staffing	1	2	3	4	5
B.	Retaining Staff	1	2	3	4	5
C.	Building teams	1	2	3	4	5
D.	Training staff	1	2	3	4	5

What makes you competent (give example(s))?

What would make you more competent (give example(s))?

Management Education Questions (medical school and management training)

(Please circle appropriate response: range from 1.very low to 5. very high)

Rate your level of agreement with the following Statements

How strongly do you agree with the following statement	level of agreement				
	very low	**low**	**neutral**	**high**	**very high**
	1	**2**	**3**	**4**	**5**
1. Management education is important for medical professionals	1	2	3	4	5
2. Management education is helpful to you in your career	1	2	3	4	5
3. Sufficient management education taught in Medical School	1	2	3	4	5
4. More management education would be helpful	1	2	3	4	5
5. It is important to seek more management education	1	2	3	4	5
6. You would take more management education if it could fit into your schedule (time permitting)	1	2	3	4	5

Appendix 9.6 Self-reported Ratings for Competency: Complete Data Results Calculations (Averages)

*The Listed Clinical and Management Tasks correspond to the Table 6.5 and Appendix 9.5.

Diploma/Certificate

	Competency on Clinical Tasks: No- Formal Management Education (Diploma/Certificate)						
						All Tasks	
Clinical Tasks	No. response	very low	low	neutral	high	very high	Total
1A	52	1	4	7	62	131	257
B	52	2	0	8	79	116	257
C	58	0	1	7	85	106	257
2A	52	0	3	8	61	133	257
B	52	2	6	10	78	109	257
C	55	0	3	16	81	102	257
D	54	0	1	8	69	125	257
3A	53	1	8	38	93	64	257
B	52	1	6	33	99	66	257
C	52	0	5	43	106	51	257
D	52	2	9	38	106	50	257
E	53	2	2	41	103	56	257
4A	52	2	8	17	90	88	257
B	53	2	7	28	93	74	257
C	52	5	7	46	85	62	257
Avg.	**53**	**2**	**5**	**23**	**86**	**89**	**257**

	Competency on Clinical Tasks: Yes- Formal Management Education (Diploma/Certificate)						
			All Tasks				
Clinical Tasks	No. response	very low	low	neutral	high	very high	Total
1A	3	1	0	4	14	28	50
B	3	0	0	4	20	23	50
C	3	0	1	3	19	24	50
2A	3	0	0	1	17	29	50
B	3	0	2	4	15	26	50
C	3	0	2	4	19	22	50
D	4	0	3	3	12	28	50
3A	3	0	2	6	22	17	50
B	3	0	2	7	21	17	50
C	3	0	2	6	24	15	50
D	3	0	2	9	22	14	50
E	3	0	1	10	22	14	50
4A	3	1	1	9	19	17	50
B	3	0	3	8	22	14	50
C	3	0	2	8	27	10	50
Avg.	**3**	**0**	**2**	**6**	**20**	**20**	**50**

Excluding Finance	Compete on Management Tasks: No- Formal Management Education (Diploma/Certificate)						
	All Tasks						
Management Tasks	No. response	very low	low	neutral	high	very high	Total
1A	72	2	15	52	80	36	257
B	72	2	10	47	97	29	257
C	73	0	11	39	93	41	257
2A	72	5	14	57	87	22	257
B	72	3	16	59	87	20	257
C	74	2	9	47	81	44	257
3A	72	8	14	65	68	30	257
B	72	5	12	65	77	26	257
C	72	3	16	63	79	24	257
D	72	5	23	73	65	19	257
4A	74	9	28	62	63	21	257
B	74	6	19	45	84	29	257
C	72	6	11	48	82	38	257
D	73	4	20	55	81	24	257
Avg.	**73**	**4**	**16**	**56**	**80**	**29**	**257**

Excluding Finance	Competency on management Tasks: Yes- Formal Management Education (Diploma/Certificate)						
	All Tasks						
Management Tasks	No. response	very low	low	neutral	high	very high	Total
1A	7	0	2	10	19	12	50
B	7	0	1	10	21	11	50
C	7	1	0	3	23	16	50
2A	7	0	3	10	16	14	50
B	7	0	1	12	20	10	50
C	7	0	0	10	16	17	50
3A	7	0	3	11	19	10	50
B	7	0	4	6	24	9	50
C	7	0	2	8	23	10	50
D	7	1	2	12	20	8	50
4A	8	1	3	13	19	6	50
B	7	1	1	12	20	9	50
C	8	1	1	12	16	12	50
D	8	0	1	16	13	12	50
Avg.	**7**	**0**	**2**	**10**	**19**	**11**	**50**

Including Finance	Competency on Management Tasks: No- Formal Management Education (Diploma/Certificate)						
	All Tasks + Finance						
Management Tasks	No. response	very low	low	neutral	high	very high	Total
1A	72	2	15	52	80	36	257
B	72	2	10	47	97	29	257
C	73	0	11	39	93	41	257
2A	72	5	14	57	87	22	257
B	72	3	16	59	87	20	257
C	74	2	9	47	81	44	257
3A	72	8	14	65	68	30	257
B	72	5	12	65	77	26	257
C	72	3	16	63	79	24	257
D	72	5	23	73	65	19	257
4A	74	9	28	62	63	21	257
B	74	6	19	45	84	29	257
C	72	6	11	48	82	38	257
D	73	4	20	55	81	24	257
5A	72	12	24	66	62	21	257
B	72	15	28	77	49	16	257
C	74	22	35	77	39	10	257
Avg.	**73**	**6**	**18**	**59**	**75**	**26**	**257**

Including Finance	Competency on Management Tasks: Yes- Formal Management Education (Diploma/Certificate)						
	All Tasks + Finance						
Management Tasks	No. response	very low	low	neutral	high	very high	Total
1A	7	0	2	10	19	12	50
B	7	0	1	10	21	11	50
C	7	1	0	3	23	16	50
2A	7	0	3	10	16	14	50
B	7	0	1	12	20	10	50
C	7	0	0	10	16	17	50
3A	7	0	3	11	19	10	50
B	7	0	4	6	24	9	50
C	7	0	2	8	23	10	50
D	7	1	2	12	20	8	50
4A	8	1	3	13	19	6	50
B	7	1	1	12	20	9	50
C	8	1	1	12	16	12	50
D	8	0	1	16	13	12	50
5A	7	2	7	12	16	6	50
B	7	1	11	12	14	5	50
C	9	3	10	13	12	3	50
Avg.	**7**	**1**	**3**	**11**	**18**	**10**	**50**

Degree (Competency)

	Competency on Clinical Tasks: No- Formal Management Education (Degree)						
	All Tasks						
Clinical Tasks	No. response	very low	low	neutral	high	very high	Total
1A	47	2	4	9	67	141	270
B	47	2	0	9	90	122	270
C	51	0	2	8	92	117	270
2A	47	0	3	9	69	142	270
B	47	2	7	13	85	116	270
C	50	0	3	20	92	105	270
D	49	0	3	9	77	132	270
3A	48	1	8	38	107	68	270
B	47	1	7	36	111	68	270
C	47	0	5	45	120	53	270
D	47	2	9	44	115	53	270
E	48	2	2	43	115	60	270
4A	47	3	7	24	99	90	270
B	48	2	8	32	106	74	270
C	47	5	8	50	97	63	270
Avg.	**48**	**2**	**5**	**26**	**96**	**94**	**270**

	Competency on Clinical Tasks: Yes- Formal Management Education (Degree)						
	All Tasks						
Clinical Tasks	No. response	very low	low	neutral	high	very high	Total
1A	10	0	0	1	11	24	46
B	10	0	0	2	14	20	46
C	12	0	0	1	16	17	46
2A	10	0	0	0	8	28	46
B	10	0	0	1	13	22	46
C	10	0	1	0	11	24	46
D	11	0	1	2	6	26	46
3A	10	0	3	7	10	16	46
B	11	0	1	4	13	17	46
C	10	0	2	4	12	18	46
D	10	0	3	4	15	14	46
E	10	0	1	6	15	14	46
4A	10	0	1	2	15	18	46
B	10	0	1	4	15	16	46
C	10	1	1	4	19	11	46
Avg.	**10**	**0**	**1**	**3**	**13**	**19**	**46**

No Finance	Competency on Management Tasks: No- Formal Management Education (Degree)						
	All Tasks						
Management Tasks	No. response	very low	low	neutral	high	very high	Total
1A	65	2	16	59	87	41	270
B	65	2	10	55	103	35	270
C	66	0	11	43	102	48	270
2A	65	5	15	63	92	30	270
B	65	3	17	65	92	28	270
C	67	2	9	52	88	52	270
3A	65	8	15	71	77	34	270
B	65	5	15	66	89	30	270
C	65	3	17	68	89	28	270
D	65	6	23	79	75	22	270
4A	67	9	31	71	68	24	270
B	66	6	20	54	93	31	270
C	67	6	12	55	89	41	270
D	66	4	21	64	87	28	270
Avg.	66	4	17	62	88	34	270

No Finance	Competency on Management Tasks: No- Formal Management Education (Degree)						
	All Tasks						
Management Tasks	No. response	very low	low	neutral	high	very high	Total
1A	16	0	1	4	14	11	46
B	16	0	1	4	16	9	46
C	16	1	0	1	15	13	46
2A	16	0	1	5	15	9	46
B	16	0	0	7	17	6	46
C	16	0	0	4	13	13	46
3A	16	1	1	5	14	9	46
B	16	1	1	4	16	8	46
C	16	1	1	3	16	9	46
D	16	1	2	5	14	8	46
4A	17	2	0	4	18	5	46
B	17	2	0	4	14	9	46
C	16	2	0	5	12	11	46
D	17	1	0	8	10	10	46
Avg.	16	1	1	5	15	9	46

Including Finance	Competency on Management Tasks: No- Formal Management Education (Degree)						
	All Tasks + Finance and Budgeting						
Management Tasks	No. response	very low	low	neutral	high	very high	Total
1A	65	2	16	59	87	41	270
B	65	2	10	55	103	35	270
C	66	0	11	43	102	48	270
2A	65	5	15	63	92	30	270
B	65	3	17	65	92	28	270
C	67	2	9	52	88	52	270
3A	65	8	15	71	77	34	270
B	65	5	15	66	89	30	270
C	65	3	17	68	89	28	270
D	65	6	23	79	75	22	270
4A	67	9	31	71	68	24	270
B	66	6	20	54	93	31	270
C	67	6	12	55	89	41	270
D	66	4	21	64	87	28	270
5A	65	14	29	71	68	23	270
B	65	15	36	81	55	18	270
C	68	24	42	80	45	11	270
Avg.	66	7	20	65	82	31	270

Including Finance	Competency on Management Tasks: No- Formal Management Education (Degree)						
	All Tasks + Finance and Budgeting						
Management Tasks	No. response	very low	low	neutral	high	very high	Total
1A	16	0	1	4	14	11	46
B	16	0	1	4	16	9	46
C	16	1	0	1	15	13	46
2A	16	0	1	5	15	9	46
B	16	0	0	7	17	6	46
C	16	0	0	4	13	13	46
3A	16	1	1	5	14	9	46
B	16	1	1	4	16	8	46
C	16	1	1	3	16	9	46
D	16	1	2	5	14	8	46
4A	17	2	0	4	18	5	46
B	17	2	0	4	14	9	46
C	16	2	0	5	12	11	46
D	17	1	0	8	10	10	46
5A	16	0	2	11	11	6	46
B	16	1	3	11	11	4	46
C	17	1	3	12	11	2	46
Avg.	16	1	1	6	14	8	46

Mentorship (Competency)

	Competency on Clinical Tasks: No- Formal Management Education (Mentorship)						
	All Tasks						
Clinical Tasks	No. response	very low	low	neutral	high	very high	Total
1A	21	1	1	4	39	75	141
B	21	0	0	5	49	66	141
C	25	0	1	3	52	60	141
2A	21	0	1	5	36	78	141
B	21	0	3	5	47	65	141
C	22	0	1	11	50	57	141
D	21	0	1	5	46	68	141
3A	21	1	6	20	61	32	141
B	21	1	5	20	60	34	141
C	21	0	2	25	65	28	141
D	21	1	5	24	63	27	141
E	22	1	2	22	66	28	141
4A	21	1	2	10	53	54	141
B	21	0	2	13	63	42	141
C	21	3	3	33	51	30	141
avg.	21	1	3	14	53	50	141

	Competency on Clinical Tasks: Yes- Formal Management Education (Mentorship)						
	All Tasks						
Clinical Tasks	No. response	very low	low	neutral	high	very high	Total
1A	39	1	3	5	39	94	181
B	40	2	0	6	56	77	181
C	41	0	1	6	58	75	181
2A	39	0	2	4	40	96	181
B	39	2	4	8	53	75	181
C	41	0	3	9	51	77	181
D	42	0	3	5	38	93	181
3A	40	0	5	25	62	49	181
B	40	0	3	21	67	50	181
C	39	0	4	26	70	42	181
D	39	1	6	26	69	40	181
E	39	1	0	30	65	46	181
4A	39	2	6	16	63	55	181
B	40	2	7	24	57	51	181
C	39	3	5	22	67	45	181
avg.	40	1	4	16	57	64	181

Excluding Finance	Competency on Management Tasks: No- Formal Management Education (Mentorship)						
	All Tasks						
Management Tasks	No. response	very low	low	neutral	high	very high	Total
1A	31	2	13	35	40	20	141
B	31	2	7	34	46	21	141
C	31	0	9	25	55	21	141
2A	31	5	10	38	46	11	141
B	31	3	12	39	47	9	141
C	32	2	6	35	42	24	141
3A	31	6	10	45	34	15	141
B	31	3	12	39	44	12	141
C	31	2	13	39	41	15	141
D	31	5	15	48	32	10	141
4A	32	6	21	43	32	7	141
B	32	4	16	34	42	13	141
C	33	5	9	40	39	15	141
D	32	3	15	38	41	12	141
Avg.	**31**	**3**	**12**	**38**	**42**	**15**	**141**

Excluding Finance	Competency on Management Tasks: Yes- Formal Management Education (Mentorship)						
	All Tasks						
Management Tasks	No. response	very low	low	neutral	high	very high	Total
1A	54	0	4	28	63	32	181
B	54	0	4	25	74	24	181
C	55	1	2	19	63	41	181
2A	54	0	6	30	63	28	181
B	54	0	5	35	61	26	181
C	55	0	3	21	62	40	181
3A	54	3	6	30	60	28	181
B	54	3	4	32	63	25	181
C	54	2	5	33	65	22	181
D	54	2	10	35	60	20	181
4A	56	5	10	34	52	24	181
B	55	4	4	25	63	30	181
C	54	3	3	22	61	38	181
D	55	2	6	35	57	26	181
Avg.	**54**	**2**	**5**	**29**	**62**	**29**	**181**

Including Finance	Competency on Management Tasks: No- Formal Management Education (Mentorship)						
	All Tasks + Finance and Budgeting						
Management Tasks	No. response	very low	low	neutral	high	very high	Total
1A	31	2	13	35	40	20	141
B	31	2	7	34	46	21	141
C	31	0	9	25	55	21	141
2A	31	5	10	38	46	11	141
B	31	3	12	39	47	9	141
C	32	2	6	35	42	24	141
3A	31	6	10	45	34	15	141
B	31	3	12	39	44	12	141
C	31	2	13	39	41	15	141
D	31	5	15	48	32	10	141
4A	32	6	21	43	32	7	141
B	32	4	16	34	42	13	141
C	33	5	9	40	39	15	141
D	32	3	15	38	41	12	141
5A	31	6	15	44	34	11	141
B	31	6	19	52	25	8	141
C	32	13	24	50	17	5	141
Avg.	**31**	**4**	**13**	**40**	**39**	**13**	**141**

Including Finance	Competency on Management Tasks: Yes- Formal Management Education (Mentorship)						
	All Tasks + Finance and Budgeting						
Management Tasks	No. response	very low	low	neutral	high	very high	Total
1A	54	0	4	28	63	32	181
B	54	0	4	25	74	24	181
C	55	1	2	19	63	41	181
2A	54	0	6	30	63	28	181
B	54	0	5	35	61	26	181
C	55	0	3	21	62	40	181
3A	54	3	6	30	60	28	181
B	54	3	4	32	63	25	181
C	54	2	5	33	65	22	181
D	54	2	10	35	60	20	181
4A	56	5	10	34	52	24	181
B	55	4	4	25	63	30	181
C	54	3	3	22	61	38	181
D	55	2	6	35	57	26	181
5A	54	8	16	40	46	17	181
B	54	11	21	42	40	13	181
C	57	12	23	45	37	7	181
Avg.	**55**	**3**	**8**	**31**	**58**	**26**	**181**

CE Courses (Competency)

	Competency on Clinical Tasks: No - Formal Management Education (CE courses)						
	All Tasks						
Clinical Tasks	No. response	very low	low	neutral	high	very high	Total
1A	18	0	1	4	27	56	106
B	18	0	0	6	29	53	106
C	21	0	0	4	33	48	106
2A	18	0	0	4	30	54	106
B	18	0	1	6	28	53	106
C	18	0	2	8	34	44	106
D	18	0	1	4	32	51	106
3A	18	1	5	15	39	28	106
B	18	1	3	14	41	28	106
C	18	0	3	18	42	28	106
D	18	1	6	14	45	28	106
E	19	1	2	18	40	28	106
4A	18	0	0	7	40	28	106
B	18	0	0	7	46	28	106
C	18	2	3	25	34	28	106
Avg.	**18**	**1**	**2**	**10**	**36**	**39**	**106**

	Competency on Clinical Tasks: Yes - Formal Management Education (CE courses)						
	All Tasks						
Clinical Tasks	No. response	very low	low	neutral	high	very high	Total
1A	47	2	3	8	54	110	224
B	47	2	0	7	77	91	224
C	50	0	2	7	78	87	224
2A	47	0	4	5	50	118	224
B	47	2	7	8	74	86	224
C	50	0	2	13	71	88	224
D	50	0	3	7	53	111	224
3A	48	0	6	29	86	55	224
B	47	0	5	26	89	57	224
C	47	0	4	32	95	46	224
D	47	1	6	35	91	44	224
E	47	1	1	34	92	49	224
4A	47	4	8	20	77	68	224
B	48	3	9	32	76	56	224
C	47	4	6	32	84	51	224
Avg.	**48**	**2**	**5**	**20**	**76**	**74**	**224**

Excluding Finance	Competency on management Tasks: No- Formal Management Education (CE Courses)						
	All Tasks						
Management Tasks	No. response	very low	low	neutral	high	very high	Total
1A	24	1	10	27	28	16	106
B	24	1	7	23	38	13	106
C	24	0	8	21	38	15	106
2A	24	4	5	30	34	9	106
B	24	3	7	29	34	9	106
C	25	2	3	25	34	17	106
3A	24	4	8	35	28	7	106
B	24	2	9	31	32	8	106
C	24	1	9	30	31	11	106
D	24	3	11	36	25	7	106
4A	25	6	12	30	26	7	106
B	25	5	11	25	27	13	106
C	24	6	8	27	25	16	106
D	25	4	11	24	31	11	106
Avg.	**24**	**3**	**9**	**28**	**31**	**11**	**106**

Excluding Finance	Competency on management Tasks: Yes- Formal Management Education (CE Courses)						
	All Tasks						
Management Tasks	No. response	very low	low	neutral	high	very high	Total
1A	67	1	7	38	75	36	224
B	67	1	3	37	85	31	224
C	68	1	2	24	82	47	224
2A	67	1	12	38	76	30	224
B	67	0	10	45	77	25	224
C	68	0	7	32	70	47	224
3A	67	5	8	43	65	36	224
B	67	4	7	40	77	29	224
C	67	3	9	42	77	26	224
D	67	4	14	48	68	23	224
4A	69	5	19	46	61	24	224
B	68	3	9	34	79	31	224
C	69	2	4	35	77	37	224
D	68	1	9	48	71	27	224
Avg.	**68**	**2**	**9**	**39**	**74**	**32**	**224**

Including Finance	Competency on Management Tasks: No- Formal Management Education (CE Courses)						
	All Tasks + Finance and Budgeting						
Management Tasks	No. response	very low	low	neutral	high	very high	Total
1A	24	1	10	27	28	16	106
B	24	1	7	23	38	13	106
C	24	0	8	21	38	15	106
2A	24	4	5	30	34	9	106
B	24	3	7	29	34	9	106
C	25	2	3	25	34	17	106
3A	24	4	8	35	28	7	106
B	24	2	9	31	32	8	106
C	24	1	9	30	31	11	106
D	24	3	11	36	25	7	106
4A	25	6	12	30	26	7	106
B	25	5	11	25	27	13	106
C	24	6	8	27	25	16	106
D	25	4	11	24	31	11	106
5A	24	5	10	28	27	12	106
B	24	5	12	36	21	8	106
C	25	8	17	42	10	4	106
AVG	**24**	**4**	**9**	**29**	**29**	**11**	**106**

Including Finance	Competency on Management Tasks: Yes- Formal Management Education (CE Courses)						
	All Tasks + Finance and Budgeting						
Management Tasks	No. response	very low	low	neutral	high	very high	Total
1A	67	1	7	38	75	36	224
B	67	1	3	37	85	31	224
C	68	1	2	24	82	47	224
2A	67	1	12	38	76	30	224
B	67	0	10	45	77	25	224
C	68	0	7	32	70	47	224
3A	67	5	8	43	65	36	224
B	67	4	7	40	77	29	224
C	67	3	9	42	77	26	224
D	67	4	14	48	68	23	224
4A	69	5	19	46	61	24	224
B	68	3	9	34	79	31	224
C	69	2	4	35	77	37	224
D	68	1	9	48	71	27	224
5A	67	10	21	54	54	18	224
B	67	12	28	56	46	15	224
C	70	18	28	52	46	10	224
AVG	**68**	**4**	**12**	**42**	**70**	**29**	**224**

Trial and Error (Competency)

	Competency on Clinical Tasks: No- Formal Management Education (Trial and error)						
	All tasks						
Clinical Tasks	No. response	very low	low	neutral	high	very high	Total
1A	8	0	0	0	12	16	36
B	8	0	0	1	11	16	36
C	9	0	0	0	10	17	36
2A	8	0	0	0	11	17	36
B	8	0	0	1	8	19	36
C	9	0	0	1	12	14	36
D	8	0	1	1	12	14	36
3A	8	1	2	3	13	9	36
B	8	1	1	4	11	11	36
C	8	0	2	6	12	8	36
D	8	1	2	5	10	10	36
E	9	1	1	8	8	9	36
4A	8	0	0	3	15	10	36
B	8	0	1	4	15	8	36
C	8	1	3	8	10	6	36
Avg.	**8**	**1**	**1**	**3**	**11**	**12**	**36**

	Competency on Clinical Tasks: Yes- Formal Management Education (Trial and error)						
	All tasks						
Clinical Tasks	No. response	very low	low	neutral	high	very high	Total
1A	57	2	4	13	70	153	299
B	58	2	0	13	95	131	299
C	62	0	2	12	101	122	299
2A	57	0	4	9	69	160	299
B	57	2	9	12	95	124	299
C	59	0	5	20	95	120	299
D	60	0	3	10	77	149	299
3A	58	0	9	45	114	73	299
B	58	0	7	40	121	73	299
C	57	0	5	47	127	63	299
D	57	1	10	47	129	55	299
E	57	1	2	46	127	66	299
4A	57	4	9	24	104	101	299
B	58	3	9	34	110	85	299
C	57	5	7	52	107	71	299
Avg.	**58**	**2**	**6**	**28**	**103**	**103**	**299**

Excluding Finance	Competency on Management Tasks: No- Formal Management Education (Trial and error)						
	All tasks						
Management Tasks	No. response	very low	low	neutral	high	very high	Total
1A	10	0	5	8	9	4	36
B	10	0	4	10	9	3	36
C	10	0	5	9	9	3	36
2A	10	2	3	7	12	2	36
B	10	1	4	11	9	1	36
C	10	0	4	9	10	3	36
3A	10	3	1	11	8	3	36
B	10	1	4	10	10	1	36
C	10	1	4	8	10	3	36
D	10	2	3	11	8	2	36
4A	10	3	5	8	9	1	36
B	10	2	7	7	9	1	36
C	10	4	5	7	6	4	36
D	11	1	8	7	7	2	36
Avg.	**10**	**1**	**4**	**9**	**9**	**2**	**36**

Excluding Finance	Competency on Management Tasks: Yes- Formal Management Education (Trial and error)						
	All tasks						
Management Tasks	No. response	very low	low	neutral	high	very high	Total
1A	82	2	12	57	97	49	299
B	82	2	7	51	115	42	299
C	83	1	6	35	113	61	299
2A	82	3	15	63	98	38	299
B	82	2	14	64	103	34	299
C	84	2	6	48	98	61	299
3A	82	6	16	66	87	42	299
B	82	5	12	61	101	38	299
C	82	3	15	60	102	37	299
D	82	5	21	74	87	30	299
4A	85	8	27	71	77	31	299
B	84	6	14	52	101	42	299
C	84	4	7	56	98	50	299
D	83	4	13	68	93	38	299
Avg.	**83**	**4**	**13**	**59**	**98**	**42**	**299**

Including Finance	Competency on Management Tasks: No- Formal Management Education (Trial and error)						
	All tasks						
Management Tasks	No. response	very low	low	neutral	high	very high	Total
1A	10	0	5	8	9	4	36
B	10	0	4	10	9	3	36
C	10	0	5	9	9	3	36
2A	10	2	3	7	12	2	36
B	10	1	4	11	9	1	36
C	10	0	4	9	10	3	36
3A	10	3	1	11	8	3	36
B	10	1	4	10	10	1	36
C	10	1	4	8	10	3	36
D	10	2	3	11	8	2	36
4A	10	3	5	8	9	1	36
B	10	2	7	7	9	1	36
C	10	4	5	7	6	4	36
D	11	1	8	7	7	2	36
5A	10	0	5	11	7	3	36
B	10	2	4	12	6	2	36
C	10	3	5	12	2	4	36
Avg.	**10**	**1**	**4**	**9**	**8**	**2**	**36**

Including Finance	Competency on Management Tasks: Yes- Formal Management Education (Trial and error)						
	All tasks						
Management Tasks	No. response	very low	low	neutral	high	very high	Total
1A	82	2	12	57	97	49	299
B	82	2	7	51	115	42	299
C	83	1	6	35	113	61	299
2A	82	3	15	63	98	38	299
B	82	2	14	64	103	34	299
C	84	2	6	48	98	61	299
3A	82	6	16	66	87	42	299
B	82	5	12	61	101	38	299
C	82	3	15	60	102	37	299
D	82	5	21	74	87	30	299
4A	85	8	27	71	77	31	299
B	84	6	14	52	101	42	299
C	84	4	7	56	98	50	299
D	83	4	13	68	93	38	299
5A	82	15	25	74	77	26	299
B	82	16	35	83	62	21	299
C	86	54	41	84	12	22	299
Avg.	**83**	**8**	**17**	**63**	**89**	**39**	**299**

No Management Education (Competency)

	Competency on Clinical Tasks: No- Formal Management Education (Management education)						
	All Tasks						
Clinical Tasks	No. response	very low	low	neutral	high	very high	Total
1A	24	1	3	4	26	84	142
B	24	2	0	4	38	74	142
C	28	0	2	2	43	67	142
2A	24	0	2	3	35	78	142
B	24	2	3	4	41	68	142
C	27	0	1	7	45	62	142
D	25	0	1	3	35	78	142
3A	24	1	2	20	58	37	142
B	24	1	3	17	55	42	142
C	24	0	2	20	64	32	142
D	24	2	1	23	58	34	142
E	24	2	0	24	55	37	142
4A	24	2	5	12	58	41	142
B	24	1	5	19	52	41	142
C	24	2	2	25	51	38	142
Avg.	**25**	**2**	**2**	**12**	**48**	**54**	**142**

	Competency on Clinical Tasks: Yes- Formal Management Education (Management education)						
	All Tasks						
Clinical Tasks	No. response	very low	low	neutral	high	very high	Total
1A	27	1	1	5	39	68	141
B	28	0	0	5	51	57	141
C	29	0	0	6	49	57	141
2A	27	0	1	6	33	74	141
B	27	0	4	6	47	57	141
C	27	0	3	11	50	50	141
D	29	0	2	6	42	62	141
3A	28	0	7	24	49	33	141
B	27	0	5	20	56	33	141
C	27	0	4	27	55	28	141
D	27	0	8	24	58	24	141
E	28	0	3	24	56	30	141
4A	27	1	3	9	47	54	141
B	28	1	4	13	55	40	141
C	27	3	8	28	45	30	141
Avg.	**28**	**1**	**4**	**14**	**49**	**46**	**141**

Excluding Finance	Competency on Management Tasks: No- Formal Management Education (Management Education)						
	All Tasks						
Management Tasks	No. response	very low	low	neutral	high	very high	Total
1A	34	0	5	25	54	24	142
B	34	0	3	25	60	20	142
C	34	0	3	14	61	30	142
2A	34	2	6	30	50	20	142
B	34	2	5	32	54	15	142
C	34	1	3	24	51	29	142
3A	34	3	6	33	45	21	142
B	34	2	6	37	44	19	142
C	34	2	8	33	50	15	142
D	34	4	12	36	45	11	142
4A	36	5	17	24	44	16	142
B	35	3	9	25	52	18	142
C	36	3	4	25	48	26	142
D	34	2	8	30	49	19	142
Avg.	**34**	**2**	**7**	**28**	**51**	**20**	**142**

Excluding Finance	Competency on Management Tasks: Yes- Formal Management Education (Management Education)						
	All Tasks						
Management Tasks	No. response	very low	low	neutral	high	very high	Total
1A	39	2	8	36	38	18	141
B	39	2	4	28	48	20	141
C	40	0	6	26	45	24	141
2A	39	3	6	33	49	11	141
B	39	1	8	35	44	14	141
C	41	1	5	22	44	28	141
3A	39	4	7	42	36	13	141
B	39	2	6	33	47	14	141
C	39	1	6	36	42	17	141
D	39	2	9	44	34	13	141
4A	39	4	13	46	29	10	141
B	39	3	12	30	38	19	141
C	39	3	8	31	41	19	141
D	40	2	12	33	40	14	141
Avg.	**39**	**2**	**8**	**34**	**41**	**17**	**141**

Including Finance	Competency on management Tasks: No- Formal Management Education (Management Education)						
	All Tasks						
Management Tasks	No. response	very low	low	neutral	high	very high	Total
1A	34	0	5	25	54	24	142
B	34	0	3	25	60	20	142
C	34	0	3	14	61	30	142
2A	34	2	6	30	50	20	142
B	34	2	5	32	54	15	142
C	34	1	3	24	51	29	142
3A	34	3	6	33	45	21	142
B	34	2	6	37	44	19	142
C	34	2	8	33	50	15	142
D	34	4	12	36	45	11	142
4A	36	5	17	24	44	16	142
B	35	3	9	25	52	18	142
C	36	3	4	25	48	26	142
D	34	2	8	30	49	19	142
5A	34	9	13	36	37	13	142
B	34	11	18	39	33	7	142
C	34	16	21	40	26	5	142
Avg.	**34**	**4**	**9**	**30**	**47**	**18**	**142**

Including Finance	Competency on Management Tasks: Yes- Formal Management Education (Management Education)						
	All Tasks						
Management Tasks	No. response	very low	low	neutral	high	very high	Total
1A	39	2	8	36	38	18	141
B	39	2	4	28	48	20	141
C	40	0	6	26	45	24	141
2A	39	3	6	33	49	11	141
B	39	1	8	35	44	14	141
C	41	1	5	22	44	28	141
3A	39	4	7	42	36	13	141
B	39	2	6	33	47	14	141
C	39	1	6	36	42	17	141
D	39	2	9	44	34	13	141
4A	39	4	13	46	29	10	141
B	39	3	12	30	38	19	141
C	39	3	8	31	41	19	141
D	40	2	12	33	40	14	141
5A	39	3	13	40	34	12	141
B	39	5	14	49	22	12	141
C	42	7	20	46	20	6	141
Avg.	**39**	**3**	**9**	**36**	**38**	**16**	**141**

Appendix 9.7 Self-reported Ratings for Confidence: Complete Data Results Calculations (Averages)

*The Listed Clinical and Management Tasks correspond to the Table 6.5 and Appendix 9.5.

Diploma/Certificate (Confidence)

	Confidence on Clinical Tasks: No- Formal Management Education (Diploma/Certificate)						
	All Tasks						
Clinical Tasks	No. response	very low	low	neutral	high	very high	Total
1A	28	1	3	12	55	158	257
B	27	1	1	7	85	136	257
C	28	0	2	10	90	127	257
2A	29	1	1	7	56	163	257
B	28	2	7	12	79	129	257
C	30	1	1	17	88	120	257
D	29	0	1	7	71	149	257
3A	28	0	9	42	117	61	257
B	28	0	10	42	114	63	257
C	29	1	11	43	120	53	257
D	27	3	16	41	119	51	257
E	29	0	4	41	123	60	257
4A	28	3	4	30	100	92	257
B	28	3	6	40	108	72	257
C	27	5	6	62	100	57	257
Avg.	**28**	**2**	**5**	**28**	**95**	**99**	**257**

	Confidence on Clinical Tasks: Yes- Formal Management Education (Diploma/Certificate)						
	All Tasks						
Clinical Tasks	No. response	very low	low	neutral	high	very high	Total
1A	2	1	1	0	13	33	50
B	2	0	2	3	17	26	50
C	2	0	1	2	19	26	50
2A	2	0	0	1	15	32	50
B	2	1	0	4	16	27	50
C	2	0	2	3	18	25	50
D	3	0	2	5	11	29	50
3A	2	1	1	6	21	19	50
B	2	1	1	5	24	17	50
C	2	0	2	8	20	18	50
D	2	0	1	13	20	14	50
E	2	0	1	7	23	17	50
4A	2	0	1	9	23	15	50
B	2	0	3	9	23	13	50
C	2	0	2	12	24	10	50
Avg.	**2**	**0**	**1**	**6**	**19**	**21**	**50**

	Confidence on Management Tasks: No- Formal Management Education (Diploma/Certificate)						
	All Tasks						
Management Tasks	No. response	very low	low	neutral	high	very high	Total
1A	57	4	16	48	95	37	257
B	57	1	12	45	110	32	257
C	59	0	9	42	98	49	257
2A	57	6	15	66	92	21	257
B	58	5	14	62	99	19	257
C	60	1	8	37	100	51	257
3A	57	5	17	68	69	41	257
B	57	5	12	67	89	27	257
C	58	6	16	64	89	24	257
D	59	6	19	74	74	25	257
4A	59	9	23	75	72	19	257
B	59	3	13	56	88	38	257
C	57	4	9	58	83	46	257
D	58	5	10	64	95	25	257
Avg.	**58**	**5**	**14**	**59**	**90**	**32**	**257**

	Confidence on Management Tasks: Yes- Formal Management Education (Diploma/Certificate)						
	All Tasks						
Management Tasks	No. response	very low	low	neutral	high	very high	Total
1A	4	0	1	12	22	11	50
B	4	0	0	9	25	12	50
C	4	0	1	3	27	15	50
2A	4	0	3	10	20	13	50
B	4	0	1	13	22	10	50
C	4	0	0	3	23	20	50
3A	4	0	1	13	22	10	50
B	4	0	3	13	23	7	50
C	4	0	3	10	21	12	50
D	5	0	3	13	18	11	50
4A	4	0	5	17	19	5	50
B	4	0	2	13	21	10	50
C	4	1	2	8	24	11	50
D	4	1	2	17	17	9	50
Avg.	**4**	**0**	**2**	**11**	**22**	**11**	**50**

Degree (Confidence)

	Confidence on Clinical Tasks: No- Formal Management Education (Degree)						
	All Tasks						
Clinical Tasks	No. response	very low	low	neutral	high	very high	Total
1A	26	1	3	11	60	169	270
B	25	1	1	8	92	143	270
C	25	0	2	11	95	137	270
2A	27	0	1	7	63	172	270
B	26	2	6	14	87	135	270
C	28	0	1	20	97	124	270
D	28	0	2	8	77	155	270
3A	26	0	8	46	125	65	270
B	26	0	10	43	126	65	270
C	27	0	10	46	129	58	270
D	25	1	15	49	126	54	270
E	27	0	5	43	130	65	270
4A	26	2	4	34	113	91	270
B	26	2	8	44	118	72	270
C	25	5	7	66	108	59	270
Avg.	**26**	**1**	**6**	**30**	**103**	**104**	**270**

	Confidence on Clinical Tasks: Yes- Formal Management Education (Degree)						
	All Tasks						
Clinical Tasks	No. response	very low	low	neutral	high	very high	Total
1A	6	1	1	1	9	28	46
B	6	0	2	1	15	22	46
C	7	0	1	1	17	20	46
2A	6	1	0	1	8	30	46
B	6	1	1	1	14	23	46
C	6	1	1	0	15	23	46
D	6	0	1	3	8	28	46
3A	6	1	2	3	18	16	46
B	6	1	2	3	17	17	46
C	6	1	2	6	13	18	46
D	6	2	3	6	15	14	46
E	6	0	0	3	21	16	46
4A	6	1	1	5	16	17	46
B	6	1	0	5	19	15	46
C	6	1	1	8	22	8	46
Avg.	**6**	**1**	**1**	**3**	**15**	**20**	**46**

	Confidence on Management Tasks: No- Formal Management Education (Degree)						
	All Tasks						
Management Tasks	No. response	very low	low	neutral	high	very high	Total
1A	51	4	17	54	102	42	270
B	51	1	12	48	117	41	270
C	53	0	9	43	110	55	270
2A	51	6	18	67	99	29	270
B	52	5	14	69	102	28	270
C	54	1	8	39	108	60	270
3A	51	5	18	74	77	45	270
B	51	5	15	73	94	32	270
C	52	6	18	66	97	31	270
D	54	6	20	78	82	30	270
4A	52	9	26	83	79	21	270
B	52	3	14	64	98	39	270
C	51	4	10	60	97	48	270
D	52	5	11	74	100	28	270
Avg.	**52**	**5**	**15**	**64**	**97**	**38**	**270**

	Confidence on Management Tasks: Yes- Formal Management Education (Degree)						
	All Tasks						
Management Tasks	No. response	very low	low	neutral	high	very high	Total
1A	12	0	0	7	18	9	46
B	12	0	0	8	19	7	46
C	12	0	1	3	18	12	46
2A	12	0	0	9	18	7	46
B	12	0	1	8	20	5	46
C	12	0	0	1	18	15	46
3A	12	0	0	9	17	8	46
B	12	0	0	7	22	5	46
C	12	0	1	9	16	8	46
D	12	0	2	8	16	8	46
4A	13	0	2	10	14	7	46
B	13	0	1	7	13	12	46
C	12	1	1	6	13	13	46
D	12	1	1	7	17	8	46
Avg.	**12**	**0**	**1**	**7**	**17**	**9**	**46**

Mentorship (Confidence)

	Confidence on Clinical Tasks: No- Formal Management Education (Mentorship)						
	All Tasks						
Clinical Tasks	No. response	very low	low	neutral	high	very high	Total
1A	7	2	0	4	36	92	141
B	7	0	1	4	52	77	141
C	7	0	1	6	58	69	141
2A	7	1	0	5	31	97	141
B	7	2	2	6	50	74	141
C	9	1	0	13	48	70	141
D	9	0	1	6	43	82	141
3A	7	0	3	24	75	32	141
B	7	0	6	23	72	33	141
C	8	1	3	28	70	31	141
D	7	1	9	28	69	27	141
E	8	0	4	26	68	35	141
4A	7	1	1	18	60	54	141
B	7	1	2	25	63	43	141
C	7	3	5	40	56	30	141
Avg.	**7**	**1**	**3**	**17**	**57**	**56**	**141**

	Confidence on Clinical Tasks: Yes- Formal Management Education (Mentorship)						
	All Tasks						
Clinical Tasks	No. response	very low	low	neutral	high	very high	Total
1A	26	0	3	8	32	112	181
B	25	1	2	6	55	92	181
C	26	0	2	6	54	93	181
2A	27	0	1	3	38	112	181
B	26	1	5	8	52	89	181
C	26	0	2	7	62	84	181
D	26	0	2	4	44	105	181
3A	26	1	7	25	73	49	181
B	26	1	6	25	71	52	181
C	26	0	8	25	76	46	181
D	25	2	8	27	76	43	181
E	26	0	1	22	86	46	181
4A	26	2	4	21	71	57	181
B	26	2	6	25	75	47	181
C	25	3	2	35	74	42	181
Avg.	**26**	**1**	**4**	**16**	**63**	**71**	**181**

	Confidence on Management Tasks: No- Formal Management Education (Mentorship)						
	All Tasks						
Management Tasks	No. response	very low	low	neutral	high	very high	Total
1A	26	4	11	28	57	15	141
B	26	1	9	27	59	19	141
C	26	0	6	24	60	25	141
2A	26	5	11	37	51	11	141
B	27	5	9	39	53	8	141
C	27	1	6	26	55	26	141
3A	26	3	10	47	38	17	141
B	26	2	11	39	49	14	141
C	26	2	14	38	45	16	141
D	26	3	14	48	37	13	141
4A	27	5	14	51	37	7	141
B	27	2	10	41	42	19	141
C	26	3	7	39	47	19	141
D	27	4	6	42	52	10	141
Avg.	**26**	**3**	**10**	**38**	**49**	**16**	**141**

	Confidence on Management Tasks: Yes- Formal Management Education (Mentorship)						
	All Tasks						
Management Tasks	No. response	very low	low	neutral	high	very high	Total
1A	40	0	6	33	64	38	181
B	40	0	3	29	78	31	181
C	43	0	4	23	66	45	181
2A	40	1	7	41	66	26	181
B	40	0	6	39	69	27	181
C	42	0	2	16	71	50	181
3A	40	2	8	36	57	38	181
B	40	3	4	42	66	26	181
C	41	4	5	37	68	26	181
D	43	3	8	39	62	26	181
4A	41	5	14	43	56	22	181
B	41	2	5	31	69	33	181
C	40	2	4	28	66	41	181
D	40	2	6	40	67	26	181
Avg.	**41**	**2**	**6**	**34**	**66**	**33**	**181**

CE Courses (Confidence)

	Confidence on Clinical Tasks: No - Formal Management Education (CE courses)						
	All Tasks						
Clinical Tasks	No. response	very low	low	neutral	high	very high	Total
1A	10	0	0	5	27	64	106
B	10	0	0	6	33	57	106
C	10	0	0	5	37	54	106
2A	10	0	0	2	29	65	106
B	10	0	0	6	33	57	106
C	12	0	1	8	34	51	106
D	12	0	1	2	31	60	106
3A	10	1	3	17	48	27	106
B	10	1	4	14	47	30	106
C	10	0	3	21	46	26	106
D	10	0	7	19	47	23	106
E	10	0	3	23	42	28	106
4A	10	0	0	11	43	42	106
B	10	0	0	17	43	36	106
C	10	2	5	28	35	26	106
Avg.	**10**	**0**	**2**	**12**	**38**	**43**	**106**

	Confidence on Clinical Tasks: Yes - Formal Management Education (CE courses)						
	All Tasks						
Clinical Tasks	No. response	very low	low	neutral	high	very high	Total
1A	26	2	5	8	45	138	224
B	25	1	3	5	76	114	224
C	26	0	3	8	78	109	224
2A	27	1	2	6	45	143	224
B	26	4	7	10	71	106	224
C	26	1	1	13	81	102	224
D	26	0	2	9	57	130	224
3A	26	0	7	32	104	55	224
B	26	0	8	33	102	55	224
C	27	1	9	31	104	52	224
D	25	3	11	37	101	47	224
E	27	0	2	26	114	55	224
4A	26	4	5	30	89	70	224
B	26	4	8	35	98	53	224
C	25	5	3	48	99	44	224
Avg.	**26**	**2**	**5**	**22**	**84**	**85**	**224**

	Confidence on Management Tasks: No- Formal Management Education (CE Course)						
	All Tasks						
Management Tasks	No. response	very low	low	neutral	high	very high	Total
1A	21	2	11	19	40	13	106
B	21	1	7	22	42	13	106
C	21	0	6	18	43	18	106
2A	21	3	8	29	34	11	106
B	22	3	9	24	38	10	106
C	21	1	5	17	44	18	106
3A	21	3	10	30	31	11	106
B	21	2	7	34	34	8	106
C	21	2	10	25	40	8	106
D	21	3	10	36	30	6	106
4A	22	4	10	35	28	7	106
B	22	2	7	32	29	14	106
C	21	3	7	26	34	15	106
D	22	4	6	26	38	10	106
Avg.	**21**	**3**	**8**	**27**	**36**	**12**	**106**

	Confidence on Management Tasks: Yes- Formal Management Education (CE Courses)						
	All Tasks						
Management Tasks	No. response	very low	low	neutral	high	very high	Total
1A	50	2	7	43	85	37	224
B	50	0	5	35	99	35	224
C	53	0	3	30	85	53	224
2A	50	3	11	48	86	26	224
B	50	2	6	54	89	23	224
C	53	0	4	24	86	57	224
3A	50	2	8	56	63	45	224
B	50	3	8	48	83	32	224
C	51	4	9	51	76	33	224
D	53	3	12	52	70	34	224
4A	51	6	17	60	68	22	224
B	51	2	8	40	84	39	224
C	50	2	4	41	82	45	224
D	51	2	6	55	83	27	224
Avg.	**51**	**2**	**8**	**46**	**81**	**36**	**224**

Trial and Error (Confidence)

	Confidence on Clinical Tasks: No- Formal Management Education (Trial and error)						
	All tasks						
Clinical Tasks	No. response	very low	low	neutral	high	very high	Total
1A	4	0	0	0	9	23	36
B	3	0	1	0	12	20	36
C	3	0	1	0	13	19	36
2A	4	0	0	0	9	23	36
B	4	0	0	0	11	21	36
C	5	0	0	3	10	18	36
D	3	0	1	2	14	16	36
3A	3	0	1	8	16	8	36
B	3	0	1	5	14	13	36
C	3	0	1	7	16	9	36
D	3	0	2	6	14	11	36
E	3	0	2	7	15	9	36
4A	4	0	0	6	16	10	36
B	4	0	0	10	16	6	36
C	3	2	2	12	12	5	36
AVG.	**3**	**0**	**1**	**4**	**13**	**14**	**36**

	Confidence on Clinical Tasks: Yes- Formal Management Education (Trial and error)						
	All tasks						
Clinical Tasks	No. response	very low	low	neutral	high	very high	Total
1A	33	2	5	13	65	181	299
B	33	1	2	12	97	154	299
C	34	0	2	13	102	148	299
2A	34	1	2	8	67	187	299
B	33	4	7	17	94	144	299
C	33	1	3	18	107	137	299
D	35	0	2	10	77	175	299
3A	34	1	10	42	138	74	299
B	34	1	11	44	137	72	299
C	35	1	12	47	135	69	299
D	33	3	15	53	137	58	299
E	35	0	4	44	142	74	299
4A	33	4	5	35	120	102	299
B	33	4	8	41	128	85	299
C	33	4	6	67	122	67	299
AVG.	**34**	**2**	**6**	**31**	**111**	**115**	**299**

	Confidence on Management Tasks: No- Formal Management Education (Trial and error)						
	All tasks						
Management Tasks	No. response	very low	low	neutral	high	very high	Total
1A	8	1	4	8	13	2	36
B	8	1	2	10	13	2	36
C	10	0	5	9	9	3	36
2A	8	1	1	11	14	1	36
B	8	1	3	9	14	1	36
C	8	0	2	8	13	5	36
3A	8	3	3	5	14	3	36
B	8	2	3	7	15	1	36
C	10	1	4	8	10	3	36
D	9	1	3	11	10	2	36
4A	8	2	3	10	11	2	36
B	8	1	3	9	11	4	36
C	8	2	5	6	10	5	36
D	8	2	4	8	11	3	36
Avg.	**8**	**1**	**3**	**9**	**12**	**3**	**36**

	Confidence on Management Tasks: Yes- Formal Management Education (Trial and error)						
	All tasks						
Management Tasks	No. response	very low	low	neutral	high	very high	Total
1A	64	3	14	54	113	51	299
B	64	0	10	47	130	48	299
C	83	1	6	35	113	61	299
2A	64	5	18	69	106	37	299
B	65	4	13	71	112	34	299
C	68	1	7	34	116	73	299
3A	64	2	15	80	83	55	299
B	64	3	12	76	103	41	299
C	82	3	15	60	102	37	299
D	66	5	18	78	92	40	299
4A	66	9	26	84	86	28	299
B	66	4	13	62	105	49	299
C	64	3	6	61	108	57	299
D	66	4	8	75	110	36	299
Avg.	**68**	**3**	**13**	**63**	**106**	**46**	**299**

No Management Education (Confidence)

	Confidence on Clinical Tasks: No- Formal Management Education (Management Education)						
	All Tasks						
Clinical Tasks	No. response	very low	low	neutral	high	very high	Total
1A	18	2	2	5	22	93	142
B	17	1	1	3	41	79	142
C	18	0	2	3	46	73	142
2A	18	1	0	6	26	91	142
B	18	3	4	5	38	74	142
C	18	1	0	6	44	73	142
D	17	0	1	3	28	93	142
3A	18	0	3	18	66	37	142
B	18	0	6	16	67	35	142
C	17	1	7	20	64	33	142
D	17	3	6	21	65	30	142
E	18	0	3	20	64	37	142
4A	18	2	3	17	61	41	142
B	18	2	4	24	55	39	142
C	17	2	2	32	57	32	142
Average	**18**	**2**	**3**	**13**	**50**	**57**	**142**

	Confidence on Clinical Tasks: Yes- Formal Management Education (Management Education)						
	All Tasks						
Clinical Tasks	No. response	very low	low	neutral	high	very high	Total
1A	11	0	2	7	34	87	141
B	11	0	1	4	54	71	141
C	11	0	1	7	49	73	141
2A	13	0	1	2	35	90	141
B	11	0	3	8	50	69	141
C	13	0	2	13	55	58	141
D	14	0	2	6	52	67	141
3A	11	1	5	26	64	34	141
B	11	1	4	28	61	36	141
C	13	0	5	28	66	29	141
D	11	0	10	28	65	27	141
E	12	0	2	27	66	34	141
4A	11	1	2	16	57	54	141
B	11	1	3	20	66	40	141
C	11	3	6	37	54	30	141
Average	**12**	**1**	**3**	**17**	**55**	**53**	**141**

	Confidence on Management Tasks: No- Formal Management Education (Management Education)						
	All Tasks						
Management Tasks	No. response	very low	low	neutral	high	very high	Total
1A	26	1	6	26	59	24	142
B	26	0	5	22	67	22	142
C	26	0	3	21	56	36	142
2A	26	1	8	34	54	19	142
B	26	1	6	35	58	16	142
C	27	0	5	15	56	39	142
3A	26	1	8	36	46	25	142
B	26	1	8	38	52	17	142
C	27	2	8	32	52	21	142
D	27	4	7	35	52	17	142
4A	27	3	14	34	51	13	142
B	27	1	8	29	55	22	142
C	26	2	3	30	52	29	142
D	26	2	5	37	53	19	142
Avg.	**26**	**1**	**7**	**30**	**55**	**23**	**142**

	Confidence on Management Tasks: Yes- Formal Management Education (Management Education)						
	All Tasks						
Management Tasks	No. response	very low	low	neutral	high	very high	Total
1A	31	3	8	32	49	18	141
B	31	1	5	27	54	23	141
C	32	0	4	20	56	29	141
2A	31	5	6	36	48	15	141
B	32	4	6	32	54	13	141
C	34	1	2	21	52	31	141
3A	31	3	8	42	37	20	141
B	31	3	5	37	48	17	141
C	31	3	8	39	47	13	141
D	33	1	13	45	35	14	141
4A	31	6	12	50	32	10	141
B	31	3	7	35	41	24	141
C	31	2	8	33	43	24	141
D	32	3	7	32	54	13	141
Avg.	**32**	**3**	**7**	**34**	**46**	**19**	**141**